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TABLE OF CONTENTS ON LAST PAGE OF READING.

FOREIGN FACTORIES IN THE UNITED STATES.

THE tariff demolishers, in their statistical endeavors, do not seem to figure out the number of foreign industries that have been brought over to the United States solely because those interested could not sell in this market and make the goods at home. In the rubber trade alone are scores of examples. The greatest hard rubber business in America was founded by the German Poppenhusen, who brought with him such men as A. D. Schlesinger, and about whose factories gathered scores of skilled German artisans, today patriotic and thrifty American citizens. Later the great hard rubber company, Heinrich Traun & Söhne of Hamburg, found it wise to build and operate their own factory in the United States.

The real beginning of the druggists' sundries business lay with the Tyer Rubber Co., started by Henry G. Tyer, an Englishman, who brought more than half a million of dollars of English money to this side of the water.

The Michelins, first in the field of automobile tires in Europe, found the tariff not to their mind, and erected a factory in New Jersey to manufacture for the Americans.

Card clothing made on a large scale in Europe was taxed at our custom house, and the English Moseleys helped to establish the Mechanical Fabric Co.

Mandelberg, a great English manufacturer of mackintoshes, quite recently equipped a factory near New York, simply because of the protection given to American manufacturers.

Nearly all of the original American elastic fabric companies, and these are many, came here because of our protective duties.

In a word, capital, skilled labor and great industries have come here to stay—to the advantage of the country—under, say, a 35 per cent. duty. Had the duty been 10 per cent. they would have stayed at home, and with their cheaper labor shut up many an American factory.

REDUCING RUBBER PRICES TO ENCOURAGE NEW USES.

A VERY interesting proposal, referred to on another page of this issue, has recently appeared in the English financial press, to the effect that the rubber planters agree to set aside one-tenth of their product to be sold to certain English and American manufacturers at 60 cents a pound, under an agreement that this shall be used in the manufacture of articles not now on the market—the purpose being to encourage new uses for rubber.

It undoubtedly would be easy to find manufacturers who would religiously live up to this arrangement, and employ any 60-cent rubber they might acquire, solely in exploiting new methods of using rubber; but would any substantial end be accomplished by this project? Obviously it would be a matter of expense to the planters, for when the market price of their rubber was 90 cents, if they sold 10 per cent. of their product for 60 cents, they would be losing 33⅓ per cent. of their legitimate price for the one-tenth sold at this figure, which would be a loss of 3⅓ per cent. on their whole product. And would this artificial lowering of price in reality greatly encourage new uses of rubber? If under this encouragement a use were found for some new rubber article, as soon as it secured recognition it would have to be manufactured from rubber at the full market price—this 10 per cent. cheap rubber being reserved exclusively for untried articles.

Rubber manufacturers, if not quite as deeply interested as the planters in the increased consumption of rubber, are, nevertheless, alert to the possibilities of the unbeaten path, and are always ready to test the

public demand for something new. It is quite probable that this natural ambition to manufacture something in which, for a time at least, they would have a monopoly, is a sufficient incentive to keep the manufacturing mind constantly at work on the possibilities of new and original lines of production.

But the one thing that will best serve as an encouragement to the extension of rubber manufacture into entirely new fields will be for the producers of crude rubber to bring their costs down, and keep them down, so that they can offer low prices not to a few manufacturers under special arrangement for a specified use, but to all manufacturers alike, for whatever use may seem to them to promise success and profit.

THE ADVANTAGE OF COMBINING TIRES WITH FOOTWEAR.

THE venerable adage about the undesirability of having one's eggs all in one basket, is as sound now as on the day when it was predicated. The United States Rubber Co. recognized the sanity of this saw, when some seven years ago it purchased the control of the Rubber Goods Manufacturing Co. Up to that time its product had consisted almost entirely of rubber footwear. It perceived the desirability of having something else to fall back upon, when the demand for footwear was slack, so it acquired a number of capable tire mills.

A number of the other large rubber manufacturing companies have taken a similar step—for instance, the Hood Rubber Co., which has added a well-equipped tire department to its footwear plant, and the Goodrich and Diamond companies, which some time ago increased the variety and volume of their product by the installation of efficient footwear departments.

There couldn't be a finer combination than the manufacture of tires with the manufacture of boots and shoes. One insures the other. The consumer is kept consuming, no matter what the meteorological conditions are. When it is prime weather for motoring, it is poor weather for rubber boots and arctics, and when everybody is clamoring for hip boots and high-top gaiters, nobody wants a tire. But the demand for one or the other goes continuously on.

Last winter, for instance, was an unfavorable one for the makers of footwear. In the greater part of the country there was but a light fall of snow. In the big cities, at any rate, one might have gone through the entire winter quite comfortably with only a pair of footholds. But the same open winter that made many people oblivious to the rubber boot and arctic, kept the call for automobile shoes and inner tubes continuous, for the car that in normal winters has been jacked up for a four months' rest was out daily on the roadway, wearing out its tires.

Where a manufacturer has both a footwear and a tire department he need not concern himself about the prognostications of the weather bureau. Every kind of weather brings grist to his mill.

RUBBER IN COLLEGE THESES.

AN interesting side light on the rubber industry, illustrating the general interest that the public takes in this subject, is shown by its popularity as a theme for college theses and school compositions. There is lying at this moment on the editorial desk a finely bound typewritten volume of 35,000 words, with sundry appendices of charts, maps and tables, on the history of the American rubber industry. It has been prepared by a candidate for an advanced degree in one of the largest of our American colleges, as a partial fulfilment of the requirements for securing that degree. The editor has been asked to look it over. It is a worthy and painstaking effort, and shows a wide reading in the literature of india-rubber.

Two days ago an application was received from a senior of another large university for suggestions as to where the best information could be obtained on the manufacture of rubber in the United States, with a view to preparing a graduation thesis on the subject. Immediately following that came a young woman, about to graduate from a high school, accompanied by her instructor, also in search of information on this interesting topic, as a preparation for the writing of a high school composition.

The editor seized a few fleeting moments from his busy life to give what assistance he could to these applicants for rubber knowledge. These are not isolated cases, for during the last year many similar requests have been received—sometimes from students—sometimes from teachers—for light on the great industry of rubber production, gathering and manufacture.

Possibly the popularity of this subject as a theme for school and college work is due to the fact that it is newer than most of the subjects that have been used for this purpose since schools were. But probably it is owing to the amount of space devoted to the various phases of rubber manufacture, and particularly to tire making, in the

daily and periodical press. At any rate it shows a very general interest in rubber in its relation to modern life.

Quite a number of the large manufacturers—with specially wise advertising departments—have recognized this general desire for rubber information, and have published little pamphlets giving a swift survey of the history, botany and general development of rubber production and manufacture; concluding naturally with a more or less extended reference to the particular product—boot or belting, tire or hose—which that company may be interested in. Where the advertising is permitted to permeate the entire story, the value of the pamphlet is materially weakened, but where the advertising is not allowed to be too glaring, the pamphlet is bound to appeal to the inquiring mind, is insured a serious reading, and consequently is effective from an advertising standpoint.

The distribution of these booklets, which takes place in response to requests from seekers after rubber light, and particularly from students engaged in literary research, is obviously a very valuable sort of distribution, for this literature not only makes a lasting impression upon the mind of the student who is deep in the preparation of his thesis, but is bound to be duly impressed upon all those who come in contact with him during this season of literary production; for nobody feels his work more profoundly than the undergraduate who is enjoying the first thrills of authorship.

THE BEST RUBBER SCHOOL.

OVER in London they have inaugurated a rubber school, or rather they have opened certain distinctively rubber courses in one of their polytechnic institutes, on "The Chemistry and Analysis of Rubber," "The Manufacture and Analysis of Rubber Goods," and kindred themes.

It is not the desire of this publication to belittle any enterprise that makes for the development of the industry. This London rubber school will probably accomplish creditable results, and certainly can do no harm, but in our own country at least, the best rubber schools are still to be found within the four walls of the factory.

This does not mean that the best way to study rubber is to enter the factory at an early age and grow up exclusively in its atmosphere; for in order to achieve the best results, the factory school should not be entered until a sound and broad foundation has been laid in the technical school. But having availed himself of the instruction given by the best technical schools, the graduate can then enter the rubber mill and acquire this particular instruction rapidly and effectively. For instance, having devoted several years to the general study of chemistry, the best place to acquire a knowledge of the special chemistry of rubber is in the laboratory of the rubber mill. Possibly some day our leading rubber experts will be found giving courses of instruction in the schools, but at present they are confining their attention to the practical running of rubber factories; and to learn what they know, one must resort thither and put himself in contact with them.

THE CALL OF CHEAP LABOR.

BRAZIL'S crude rubber industry is threatened by Eastern plantation rubber. Labor in the Brazilian rubber sections was, and is, scarce and high priced. At the call of the cheap and abundant labor in Ceylon, the Malay States, Java and contiguous territory, the Brazilian industry of Pará rubber production was moved half across the world in less than ten years. So much for tropical industries.

Now as to those of the temperate zone. There are in Central and Northern China millions of capable, thrifty, industrious workmen who would joyfully hustle fifteen hours a day for fifteen cents. They would make excellent workers in any line of rubber manufacture where labor is a chief consideration. Their call to American manufacturers has heretofore been unheeded. But, if competition with European cheap help is forced upon the American manufacturer, and further if to meet such competition he is not to be allowed to adjust his wage scale to suit new conditions, will he not be forced to listen to this call?

In the light of rubber history will not the present tariff program end in the establishment of great American shoe, tire and sundries factories in Chinese centers of cheap labor?

NOT ALONE IN THE GREAT COMPANY THAT HE NOTABLY helped to create, but all over the world is the passing of Adolph Prinzhorn heard with sincere sorrow. His unruffled friendliness, his broad charity toward human frailties, and his genuine interest in all that was for the good of the trade made him a most lovable character. His friends were not only the best and most distinguished men in the Fatherland, but in the United States, in England, and in the Middle East. Such men, citizens of the world, friends of humanity, are potent apostles of industrial integrity and progress. We voice the thought of the world's rubber trade in tendering sincere sympathy to the Continental Caoutchouc & Gutta Percha Company for their great loss.

A. STAINES MANDERS HAS, ABOVE ANY OTHER MAN that we know, the rare faculty of organizing great exhibitions of international interest. What he has done in the past in rubber exhibitions has been of the greatest educational value. Rubber planting was new, and thousands who were interested wanted to have the graphic presentment of the exhibition, to supplement and explain what they had read in the printed page. Hence governments, planters and those who supplied planters, were eager to exhibit. Like all other industries, however, rubber planting is fast getting upon a stable basis and its novelty is disappearing. In the future the new tools, machines, processes and products will steadily lessen in number. Under these conditions it will be only the novel that will be willingly shown, and the result will be a steadily diminishing volume of exhibits—that is, if rubber exhibitions were planned every two or three years *ad infinitum*. We hold no brief for Mr. Manders, but it would seem that he appreciated this situation. The fact that he planned a fibre exhibition to be held in an adjoining building, and at the same time as the 1914 Rubber Exhibition, would point to such conclusion. In his announcements Mr. Manders says: "A similar exhibition will not be held until 1918 or perhaps latter."

If all that is new in rubber, in fibres, in coffee, cacao, cane, and all of the varied tropical products could be shown once in two or three years in London, the joint exhibitions would be very great, and valuable beyond description.

The Tropics are just beginning to be generally exploited. A comprehensive Tropical Products Exhibition, including of course all that is new in rubber, is what is needed.

IN VIEW OF THE PRESENT TARIFF SITUATION ONE OR TWO statements which appear in the letter from our Japanese correspondent, in this issue, are interesting. He is describing the industry of making rubber toy balloons in Japan. He says that the imports of toy balloons into Japan ceased some years ago. He then goes on to remark that the lowest grade of the imported toy balloons of former days cost the Japanese dealer 25 cents a gross, while the same thing is now being produced in Japan at the price of 7½ cents a gross. Later in his letter he makes a statement that renders it very clear how the home product can sell at one-third the price of the imported article. He says: "The average daily wage of the women balloon makers is 20 sen (10 cents) for ten hours. The average daily rate for rubber manufacturing workers, male and female, is 50 sen (25 cents) for ten hours." There you have the contrast;—rubber workmen in Japan receiving 25 cents a day and rubber workmen in America receiving from ten to twenty times that amount. Men who work for 25 cents per day have to live on a 25 cents a day scale. Is that, or any approximation thereto, desirable in this country? That is the crux of the tariff question.

AN ENGLISH PAPER SPEAKS OF THE FACT that the question is being agitated of organizing a rubber club in London. It certainly would seem as if London could support such a club. There has been a rubber club in this country for fourteen years, and it is a highly successful organization. It has a membership of nearly 350, and the midwinter dinner, midsummer outing and other gatherings of the club are largely attended. It also has an inner membership, called a "firm membership," in which between 50 and 60 of the leading rubber concerns of the country are represented, which is devoting itself to the solution of the important problems pressing upon the American rubber trade today. To be sure, the English rubber manufacturing industry is less than one-half that of the United States, but it is a large and important field, in addition to which are the great rubber plantation interests centering in that city. A rubber club in London ought certainly to prove a successful and valuable organization.

IF ANYONE HAS BEEN UNDER THE IMPRESSION that the use of the automobile had about reached flood tide and was unlikely to remain stationary or possibly to recede, his impression was erroneous. The Secretary of State for New York announces that the number of automobile owners who have registered during the past three months has exceeded the 100,000 mark, which is more than 20,000 over the number registered during the same period last year. The registration fees collected during the same period came within $8,000 of reaching a million—which is nearly $325,000 in excess of the fees for the same time last year.

The same situation has developed in Ohio, where the registrar of automobiles announces that in point of registrations the entire number for 1912 was exceeded on May 10, the registrations at that time for this year being 63,720, as compared with 63,117 for the entire twelve months of 1912.

Obviously, the stationary period of automobile consumption has not only not been reached, but is nowhere in sight.

Rubber in Southern Brazil—II.

By the Editor of The India Rubber World.

The Rubber Port of Bahia—Chats with Exporters—Courtesies from Brazilian Officials—Local Washing Plants—Wide Distribution of the Manihot—The Four Principal Kinds—Methods of Gathering—Yield According to Dr. Quinn—Dr. Zehntner's Figures.

MORE than eighty per cent. of the *Maniçoba* rubber produced by Brazil's southern states comes out at the port of Bahia. It is therefore an interesting place to the rubber man, and one that I was more than anxious to see.

BOAT LANDING, BAHIA.

A PLANTED AREA ON THE UPLANDS.

Somewhere I had formed the idea that the landing was difficult and dangerous, so when we left the steamer in a comfortable launch and disembarked at a very respectable pier, the surprise was an agreeable one.

The water front buildings were a bit ragged in outline and the piers crowded with merchandise and debris, but that was due in part to the Port Work preparations of the French concessionaires. This concession is to be a monopoly, the company charging for every pound of cargo entering the port. The quays are to have 36 feet of water at low tide, the fill being made by pumping from the harbor. Modern warehouses, cranes, etc., will be installed, and as All Saints Bay is better adapted in its surroundings for expansion than is the bay at Rio, the city of Bahia has great future possibilities.

The city is built first on a narrow terrace but a trifle above tide water, then on a steep incline, and then on a plateau high above the first tier of buildings. To get to the upper city there is a steep inclined plane, and for foot passengers a big double elevator.

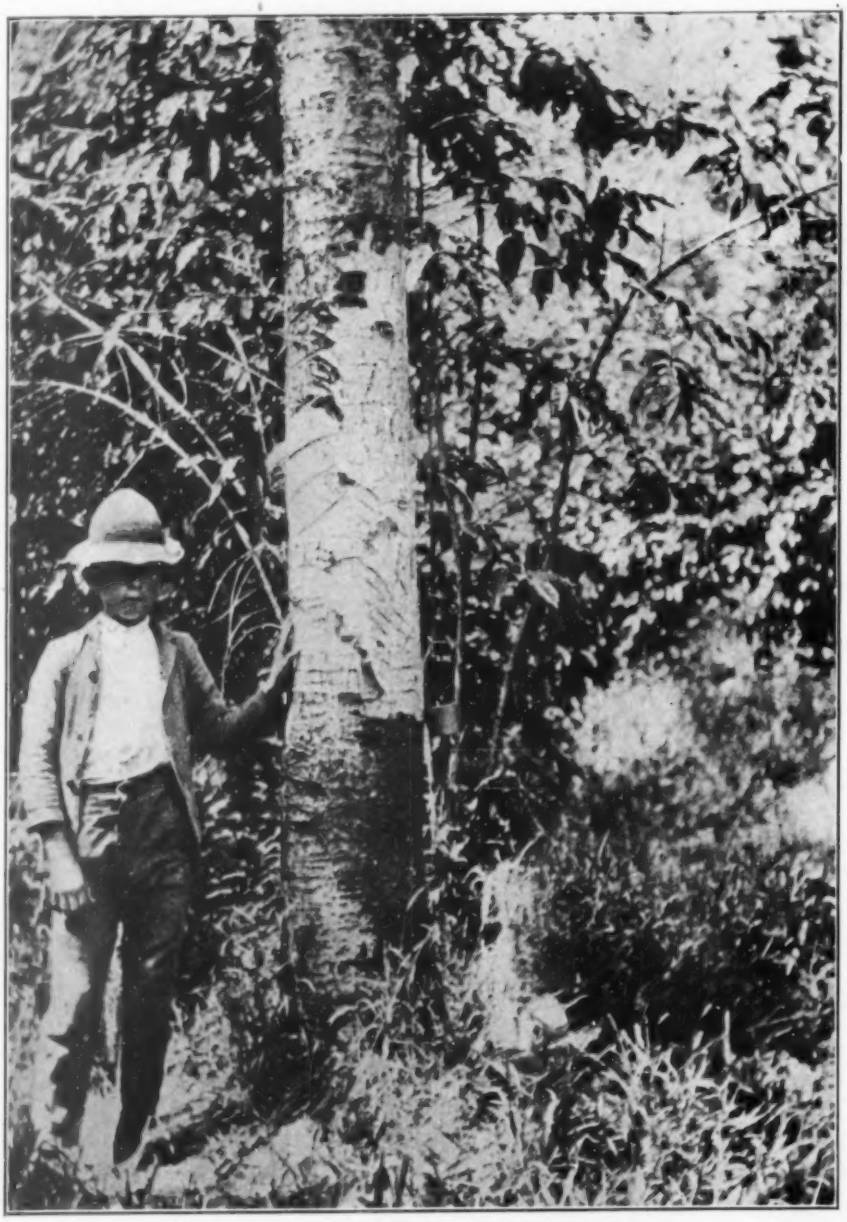
Like Brooklyn it is a city of churches, the total being 260; and others, so it is said, are projected. There are many fine buildings, a fair second-class hotel, some excellent *pensions,* and the finest oranges that the thirsty traveler could desire. As befits an ancient city, the streets are grotesquely narrow, although the modern spirit is evident in the broadening of some of the main thoroughfares, which means cutting long blocks of high buildings clear to their centers. There is to be a central avenue 250 feet wide. There are excellent trams, the usual tropical carriages and some 100 automobiles and motor trucks. Speaking of the latter, tires suffer severely, and motor owners are constantly complaining. This is due to the uneven stone pavements, the car-tracks and the reckless driving—that is, in part. Another reason is that seconds

MAP SHOWING *Manihot* AREA IN EASTERN BRAZIL.

and thirds in tires have been sent to this market, and when they gave out were bought in for a few cents, shipped abroad, mended and came back as new ones.

There are five firms in rubber exporting in Bahia, and two of them have cleaning plants of their own. Several are also interested in *Manihot* plantations in the interior. We visited all of them and found them more than willing to give information, and deeply interested in the future of Ceará rubber. Incidentally none seemed to believe that any general plan for washing all of Brazil's rubber would be of value, either to producer or manufacturer. One said very plainly that the existence of dirty rubber was due to the cupidity of the rubber manufacturer. He purchased dirty lots in the hope of getting a cheaper rubber content. If he bought only clean rubber, such would in time be the only product.

We learned that last year caterpillars destroyed many of the rubber trees, and that this year the rains were delayed so that another setback was feared. Indeed some of the local rubber men were very gloomy about the future of *Manihot* planting because of insect pests — such as caterpillars and white ants—and droughts. At the same time they acknowledged that wild *Manihots* were not killed off, and that it cost 50 per cent. less to gather plantation rubber than wild.



PLANTATION *Manihot Glaziovii*—7½ YEARS OLD—35 INCHES IN GIRTH—IN COURSE OF TAPPING.

Then, too, there are the taxes and costs of transportation. They were all of the opinion that the whole export tax on Ceará rubber should be taken off, for a time at least. They also cited the freight rates on the railroads as being far too high. For example, from Joazeiro to Bahia—about 577 kilometers—the rate is 670 reis for 10 kilos, or about what it costs from Bahia to Europe. Labor is also scarce and food and all other supplies are very high.

The courteous head of the *Defesa da Borracha,* in Rio had cabled ahead to the department in Bahia, and the result was courteous attention on the part of Sr. Alvaro Ramos and the heads of the local *Defesa,* who arranged audiences with the Governor, the Secretary of State and other high officials. They were all exceedingly polite, and opened every avenue to us in our endeavors to gather information concerning rubber.

The rubber fields — that is where the *Manihots* grow, either wild or planted—are not of easy access from Bahia. The nearest is a day's journey, and the best up the San Francisco River are five days away, the journey involving railway travel, water travel and mule riding.

But first a bit on the various *Manihots* about which there has been considerable confusion. Only a short time ago but one was known, the *Glaziovii.* Today four distinct types are recognized, and only last winter I met a student of the tree who said he was sure that there were at least seven. Right here it may be well to describe the four, not botanically, but in such terms that the non-scientific may be able easily to identify them.

The *Manihot* was formerly called the *Jatropha Elastica,* and it is a blood cousin of the *Manihot Utilissima,* which produces sweet cassava, and the *Manihot Palmata,* or bitter cassava. The product of the various *Manihots* is called Ceará, *Maniçoba,* Jequie or *Manihot* rubber.

American manufacturers for a long time ignored Ceará rubber. The Europeans, however, used it freely, and have always claimed that under most conditions it was the equal of Fine Pará.

The *machadino*, which has so irreparably damaged the Pará forests of the Amazon, is very generally used for tapping the *Manihot Glaziovii*, to which it does just as much harm. In Bahia, however, the other sorts are tapped by a kind of home-made farrier's knife that answers the purpose very well.

Manihot Piauhyensis—FOUR YEARS OLD—AVERAGE YIELD PER ACRE 232 POUNDS OF DRY RUBBER.

In tapping the *Glaziovii* and *Dichotoma* the outer bark is first removed and the tree trunks tapped in zigzags. The roots are pared half-herring-bone fashion but roughly. On the tree trunk the latex is caught in cups, but the general procedure is to tap the trunk low down between the roots and dig a shallow hole at the base of the tree. Into this the rubber milk trickles, its watery content being absorbed by the soil. The sand with which the hole is dusted sticks to the rubber and makes it easier to handle, and also decreases its value very considerably. In the past the Ceará milk was allowed to coagulate on the tree, and the result was a good dry rubber containing some bark. Some of the planters are now preparing *Manihot* rubber in sheets that are clean, dry and in every way excellent. This can only be done in plantations or where it is possible to superintend the tapping of wild trees. Most of the rubber at present comes from trees scattered over a vast wild area, impenetrable except by native tappers, who are paid by weight. The result is, as a rule, very dirty, wet rubber, badly coagulated and containing stones, bark and dirt. Wherever it is possible to gather the latex in receptacles, clean rubber of fine quality is the result.

Manihot Dichotoma—ONE TO SEVEN YEARS OLD.

The *Manihot Glaziovii*, or Ceará rubber tree, grows to a height of forty feet with a diameter of twelve inches. It has many branches, the lowest of which is about six feet from the ground. The bark is dark purple with transparent film-like epidermis, which curls off as bark is removed. This exfoliation is usually removed before tapping. The leaves are large, and are divided in five, and sometimes there are seven parts. The leaf stalk and veins are whitish. The planters were deceived at first by the favorable appearance of this tree, and planted it extensively, but it did not produce well. It is found wild in Ceará, Parahiba and Rio Grande do Norte, is deciduous and thrives in dry lands and mountain regions—in fact, will grow anywhere.

The *Manihot Dichotoma*, or Maniçoba of Jequie, derived its last name from a town in the state of Bahia, which is the center of commercial trade in this rubber. It is a small tree, with a trunk scarcely exceeding 10 inches in diameter. The bark is smooth and purplish in color with parchment-like epidermis, similar to the *Glaziovii*. The leaves when new are of peculiar shield-like shape, and later become digitate. It is found in the southeastern districts of the state of Bahia, and along the Paraguasu and Contas rivers. It thrives best in red clay soil, and is rarely found in sandy soil, or if so, gives much less rubber.

The *Manihot Heptaphylla* (Ule) is a small tree, growing to the height of seven to sixteen feet, with a diameter of four to six inches. The trunk is comparatively short and stocky, dividing into two or three branches which form a full-leaved top of a lively green color. The bark is dark gray in color, and the leaves are usually divided in seven lobes. The seeds are light colored, without the sharp edges, thereby differing from the Ceará, and are larger. This tree is found exclusively

on the right margin of the San Francisco river, growing in the mountains and rocky places.

HOUSES AND STORE ON *Manihot* PLANTATION EIGHT DAYS FROM BAHIA.

The *Manihot Piauhyensis* originated in the state of Piauhy, and although small in size is most important as a producer of rubber. It resembles the *Heptaphylla*, with a height of seven to sixteen feet and a diameter of four to six inches. The trunk, smooth and light gray in color, divides into two or three branches forming a full spreading top. The leaves are usually divided in five and sometimes seven parts. They are digitate in form with the points rounded, a peculiarity of the *Piauhyensis*. The seeds are similar to the *Heptaphylla*. This tree, found in the state of Piauhy along the dividing line of the state of Bahia, and between 8° and 10° south latitude, and as far to the north as Itamaraty or San Pedro. It grows principally on the small mountain slopes and ridges.

Like the *Hevea* the *Manihot* shows one type which Dr. Quinn calls the *Manihot Brava* which gives no rubber at all, but which is easily confused with the good

Manihot Heptaphylla—NINE MONTHS OLD.

Manihots—that is, those that do produce rubber.

Manihots have more than once been suggested as adapted to cultivation in the United States, particularly in parts of Florida and Texas. Indeed, at one time one of the Southern experiment stations started their cultivation. The matter was not carried far, however, and no conclusions reached. That they could be grown in the Philippines and Porto Rico, as they are in the Hawaiian Islands, there is no doubt.

So many different figures were given as to the yields of *Manihots*, that I was at a loss to wholly reconcile the great differences that were but too apparent. Of course in some cases my informants had taken the product of certain trees that were abundant producers, and based their estimates upon them. In others they were frankly optimistic

TAPPING *Manihot Piauhyensis*, RESACCA ESTATE, MINAS.

promoters. I have therefore turned to the statements of Dr. Santiago Cardwell Quinn, who is in the center of the *Manihot* district, and an unbiased observer. He says:

"The tapper works approximately six months in the year, covering January to June. He takes one set of 650 trees, on the average tapping on Mondays and Tuesdays 250 trees per day and on Wednesdays 150. On Thursdays and Fridays he re-taps Monday's and Tuesday's lots and on Saturdays those he tapped the previous Wednesday. The same trees are tapped twice a week. With *Manihot*, as with *Hevea*, the so-called wound response is very marked.

"In the season his output may be taken on the average at 360 kilos of damp rubber, equivalent to about 475 pounds market rubber, or, say, equivalent to about 285 pounds actual dry rubber. He is paid by the kilo, depending more or less on the state of the market. Nowadays the average price may be taken at 1$200 Brazilian—or say 29 cents—per pound for market rubber, or about 48 cents per pound for dry rubber. These costs, however, do not represent the real ones. The tapper is paid really by a barter method as on the Amazon, and the profits on the barter transaction must be deducted in order to arrive at the true cost. We may deduct, therefore, at least 12 cents per pound on this head, making the original net cost about 17 cents per pound.

"The carriage of this rubber to the railway is not so great as one might imagine. Thus every year some 200 to 300 tons of *Manihot* rubber is despatched from Gruna, an important rubber center in Bahia at some distance from the right bank of the River San Francisco, for shipment on rail at Bomfim. The distance is about 150 miles, and the pack-mules, carrying 250 pounds each, take five days on the journey, at the regular rate of 12 milreis—$3.80—per mule, which works out at about 1½ cents per pound. The rubber is packed in sacks which represent a small item. There are town dues amounting to 16 cents per 30 pounds, and a rail freight to the port of Bahia of about 38 cents per 30 pounds, whilst the sea freight is rather under $19 per ton weight to New York or Liverpool."

BADLY TAPPED *Manihot Dichotoma.*

SHOWING THE TWO DISTINCTIVE GROWTHS. x1—*Heptaphylla*, x2—*Piauhyensis.*

As in Pará the export tax on rubber at Bahia (11¼ per cent. ad valorem) is assessed through the "Pauta" or valuation taken every two weeks, and based upon the market price at the time of the last valuation. It amounts to about 5 cents per pound. In Minas, at 3½ per cent., it amounts to 1 to 2 cents a pound.

In this connection it will be interesting to note the figures given by Dr. L. Zehntner on the production of the Maniçobas of Bahia. These observations were made at the Villa Nova Plantations, Bomfim, Bahia, and are as follows:

Age.	Dry rubber on tree, one day.	Dry rubber on tree, 60 days.	Dry rubber 700 trees, 60 days.
2 yrs.....	2 Grs.	120 Grs.	185 lbs.
3 "	3 "	180 "	277 "
4 "	4 "	240 "	370 "
5 "	5 "	300 "	463 "

The *Manihots* cover an immense area of the healthy uplands of Southern Brazil, a territory running 1,000 miles north and south and as much east and west.

There are, of course, sections where it does not appear at all, and others where it is inaccessible. In eleven of the great Brazilian states it is found wild, but its gathering is chiefly in the states of Bahia, Ceará, Piauhy and Maranhao. So far the planting of *Manihots* in Brazil has been in the states of Bahia, Minas and Piauhy. There are also several in Rio, and even as far south as Sao Paulo. It is estimated that there are at least three million trees in the Brazilian plantations at the present time.

Of the Ceará plantations so far installed a few are owned by Americans, Germans and French. The Michelins, for example, are said to be back of one that is distinctly French.

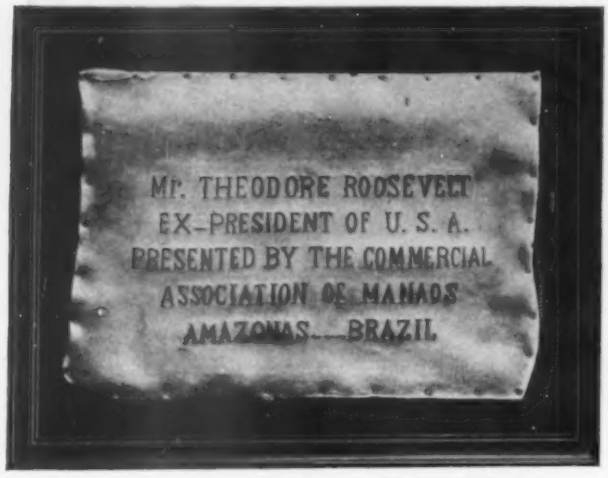
It is an interesting fact, however, that most of the plantations are owned by Brazilians, particularly as the salvation of the rubber industry, as far as Brazil is concerned, seems to lie in rubber planting.

(To be Continued.)

The accepted authority on South American rubber—"The Rubber Country of the Amazon," by Henry C. Pearson.

INTERESTING RUBBER SOUVENIRS.

THREE very interesting souvenirs, showing progress in rubber preparation up the Amazon, were given to the Editor of THE INDIA RUBBER WORLD after the close of the New York



SHEET OF AMAZONAS RUBBER PRESENTED TO MR. ROOSEVELT.

Rubber Exposition. They represented fine sheets of unsmoked *Hevea* rubber, prepared in Amazonas, and were intended for President Taft, Ex-President Roosevelt and the Editor of THE

SHEET OF AMAZONAS RUBBER PRESENTED TO MR. PEARSON.

INDIA RUBBER WORLD. The illustrations show two of them mounted and framed; and as the first of their kind they are certainly historic.

THE CLYDE RUBBER WORKS CO.'S NEW PLANT.

The Clyde Rubber Works Co., Ltd., of Glasgow, Scotland, has just removed to its new plant at Renfrew, a short distance from Glasgow. This new plant has been specially erected to meet the company's requirements and is equipped with the most modern machinery, electrically driven. These greatly increased facilities will enable the company to meet the demand for its goods with the utmost promptness.

FRENCH VIEW OF BRAZILIAN SITUATION.

M. O. LABROY, a French engineer (who, in conjunction with M. V. Cayla, recently made a journey of investigation through Amazonia, on behalf of the Brazilian government), lately returned to France to purchase the plant necessary for the contemplated experimental stations. He has contributed to the "Bulletin" of the Paris Brazilian Information Bureau an article embodying his views on the situation and the measures proposed for remedying it.

In the first place he recalls the fact that the Amazon Valley (which exported last season 40,000 tons of rubber) derived this valuable product almost exclusively from two varieties of trees, which are still to be found in abundance in the vast forests in the territory drained by the various rivers. This rubber-extracting industry occupies annually more than 150,000 workers, or *seringueros*, whose task is to collect the milk flowing from incisions in the lower part of the trees, transforming this milk, by the heated smoke of a fire of palm nuts and certain indigenous woods, into a gum of industrial and commercial value far exceeding that of any other description.

In view of the spontaneous growth of new trees and the reserves of virgin forest, the writer expresses the opinion that the Brazilian rubber-extracting industry is not in any immediate danger from the exhaustion of supply; while even a marked reduction in present values would not materially affect the Amazonan production. Still, the northern States of Brazil, which derive their principal revenues from the rubber export tax, have, in conjunction with the Federal government, decided to put into force a series of economic measures tending to reduce the cost price of rubber and at the same time to develop agriculture in the different productive centers.

The service of the "Protection of Rubber" was organized last year in accordance with the new law, due to the intelligent initiative of Dr. Pedro de Toledo, minister of agriculture. After deciding upon the creation of a rubber manufacturing industry at Rio de Janeiro, the commission settled the important question of coal depots on the Amazon and navigable rivers. A commission of hydrographic engineers has been making surveys for the improvement of the navigation of the Rio Branco and a similar work will soon be undertaken on the Rio Negro.

A trial of agricultural colonization is now being made on the national *fazenda* of São Marcos, and will furnish indications of value in future enterprises of this kind.

While giving attention to the improvement of river transport, the question of sanitation has not been lost sight of, commissions of doctors under Dr. Oswaldo Cruz being engaged in studying the various diseases prevalent among the Amazonian population.

Finally, agronomic stations are being established in the states of Pará, Amazonas, Matto Grosso, Bahia, Piauhy and Minas Geraes. These stations will be specially devoted to the study of various technical and scientific problems connected with the rational production of rubber. Such establishments in the natural centers of production, with perfectly equipped laboratories and installations, will prove an important feature in the plans of colonization, in regions where agriculture is but little advanced. The development of agricultural production is regarded as a matter of primary importance, without which there is no lasting prosperity to be anticipated. The Valley of the Amazon presents very favorable conditions for such development.

It is pointed out that the cultivation of *Hevea* would be easily supplemented by that of Cacao, young and old trees having proved equally fruitful, notwithstanding the absolute lack of rational treatment. Other products which could also, in M. Labroy's opinion, probably be successfully raised are tobacco, sugar cane, cocoanuts, rice and bananas.

Such are a few of the features of the present movement which, according to M. Labroy, are now being carried out for the direct or indirect benefit of Brazilian rubber cultivation.

The Plantation Rubber Industry.

By Cyril E. S. Baxendale.

A PAPER READ AT THE THIRD INTERNATIONAL RUBBER CONFERENCE, HELD IN NEW YORK, 1912.

EARLY HISTORY.

IT is remarkable that—as civilization has become dependent on cultivated produce—the profitable cultivation of rubber should have been, for years, open to doubt.

It was in 1876 (not less than 36 years ago) that *Hevea* seeds were brought from Brazil to Europe by that prince of smugglers, Mr. H. A. Wickham. There was an earlier attempt, but as the few seedlings raised all died, we need not waste time over that. From the 70,000 seeds collected in Brazil by Mr. Wickham, 2,800

CYRIL E. S. BAXENDALE.

plants were raised at Kew Gardens (London) and, in the same year, shipped to the Perideniya Gardens of Ceylon (Ridley tells us) as a depot for the plants from which the cultivation might be spread all over those British Colonies wherein the plant could thrive.

In 1877 a case of 22 plants reached Singapore and were successfully planted by Mr. Murton, the then curator of the newly founded Botanic Gardens there. The same year the first *Hevea* trees arrived in the Malay States. Two cases were sent from Ceylon to the late Sir Hugh Low (British resident of Perak) who planted them at Kwala Kangsar, and, I am glad to say, he lived long enough to see something of the great success of the industry that he helped to found.

It may seem strange that these trees reached maturity many years before it was realized that they were capable of yielding a sufficient quantity of rubber to make their regular tapping profitable. The only explanation I can offer for this is that the duty of tapping them was relegated to Sakeis (Malayan Aboriginals), who adopted the same methods they applied to the collection of wild rubber; that is to say, they hacked them with choppers, while the results they achieved were insufficient to tempt any capitalist to put ten cents into the business.

It is to our scientist friends that we owe the primary knowledge of how these trees might be made profitable. On what we now consider to have been a red-letter day in the year 1888, Mr. H. N. Ridley was appointed director of the Botanic Gardens in Singapore and very soon afterwards commenced experimental tapping; but it was not until 1891 that the first sample of plantation Pará was sent to London from Malaya, and was favorably reported upon by experts. During the nineties, several gentlemen in Ceylon, and Mr. Derry and my learned colleague, Mr. Leonard Wray, in Malaya, continued the experiments.

The first actual sale recorded from Malaya was in 1899, from the trees planted by Sir Hugh Low, and realized 3s. 10d. a pound. The trees were then 22 years old. To the brothers Kindersley belongs the honor of first planting rubber on a commercial scale in our country. That was in 1895, and within three years the late Mr. W. W. Bailey and several other planters, including the humble individual now addressing you, had summoned up sufficient courage to plant a few hundred acres amongst them. To attribute this slow development to lack of enterprise would be unjust. If any explanation is required it must be attributed to lack of money. At the time of which I am speaking, we were all coffee or sugar planters, struggling for a bare, very bare, existence. Some of us may have had the privilege of being on terms of a nodding acquaintance with men of means, but not many of these could recollect that rubber was useful for any practical purpose, except for the erasure of pencil marks.

A favored few had seen or heard of a Mr. Charles Rolls, traveling in a horseless carriage preceded by an ancient man on foot, carrying a red flag as a danger signal; but, probably, none of these realized that this object of merriment was the forerunner of the greatest mechanical industry of the age, or if they did, would not, at any rate, have found it a reason for supporting the schemes of would-be rubber planters.

Rumors of remarkable results from the first planted *Hevea* trees of Ceylon and Malaya reached Europe, and as the years rolled on a few speculative—or may I call them, far-sighted—persons staked a portion of their savings on the new venture.

The extension of the area under *Hevea* in Malaya, which in 1905 amounted to about 38,000 acres, increased at an average rate from that year of about 70,000 acres per annum. The total area at the end of last year (1911) was 542,877 acres.

THE BOOM.

During 1909 the income from the older companies attracted the attention of the investing and speculating public of Europe in general—and Britain in particular—as being unusually large for an agricultural industry. At the same time the value of crude rubber went up by leaps and bounds, bewildering even to those acquainted with the elastic nature of the subject; and indiscriminate speculation was indulged in, of which the promoter of many a wild-cat proposition took full advantage.

It is said that the boom far exceeded that which heralded railway development 70 years ago and can only be compared with another that occurred in the reign of our late Queen Anne in connection with a venture known as the South Sea Bubble.

Well, *our* Bubble, has since deflated somewhat, I am glad to say, but it has not burst; and I think it may be said that the planters who had borne the burden and heat of the day generally kept their heads in spite of the somewhat embarrassing attention paid to their humble efforts, and this had much to do with steadying the market when the bubble was soaring, and also in stopping total deflation when investors rushed to the other extreme.

CLIMATIC CONDITIONS.

The reason the Malay Peninsula attracted most attention for this purpose was, primarily, its regular rainfall. It is commonly said that there are two seasons in that country. One is the wet, and the other is the d——d wet season.

This peculiarity is due to its unique situation as the meeting place of the N-E Monsoon of the China Sea and the S-W Monsoon of the Indian Ocean. After the subsiding of the rains of the

S-W Monsoon, the N-E commences and as the width of the Malay Peninsula does not exceed 170 miles in any part, the land on both coasts is affected by either monsoon.

I have kept the rainfall records at Jugra for 14 years and have never experienced a month without rain, and rarely a month below the average rainfall of Britain. It must be admitted that some of us, in cabling particulars of our monthly outputs, explain a shortage against the estimate by adding "owing to the drought"; but the truth is we have yet to experience the true meaning of the word "drought." There are very few days in the year when it is too wet to work, and this, of course, gives us a great advantage over the collector of wild rubber on the Amazon, where I understand there can be no tapping for several months of the year.

HEALTH.

A very considerable change has come over the conditions of life in Malaya. I regret to say that many of the plantations can hardly yet be described as health resorts; but there has been an immense improvement, and in view of the more or less recent discoveries of our medical men there is good reason to hope that the improvement will continue. To Sir Patrick Manson and Professor Ross we owe the original discovery that the *Anopheles* mosquito is the principal, if not the only, carrier of malarial infection, and the doctors of Malaya have amongst them done excellent work as a result of this discovery. I would single out Dr. Malcolm Watson for special mention, as his work as medical adviser to plantations has come, particularly, under my notice.

He has discovered that the variety of *Anopheles* which favors the coast districts, rarely, if ever, travels more than one-half a mile from the jungle, and there is practical immunity in dwelling places at this distance.

The valleys, in some of the inland districts, harbor another variety of the *Anopheles*, the spawn of which can exist in running water, and can only be got rid of by carrying the water away in enclosed drains. Interesting experiments in this direction are now being carried out by several rubber companies in Selangor.

Thanks to the natural richness of the soil, a considerable amount of capital was attracted to British Malaya from Ceylon, where there was comparatively little suitable land available, and our community owes something of its success to the cash and experience introduced from that colony.

GOVERNMENT AND PLANTER.

Although the new applications for land are still sufficient to tax severely the resources of our over-worked (and not over-paid) Survey Department, the increased rent and export duty has driven a certain amount of British capital to the Dutch Colonies of Java and Sumatra, and considerable development has recently been made in those islands, as well as in Borneo.

When stating these facts, I do not wish it to be understood that I am advocating the avoidance of British Malaya as a country for investment, or that I would belittle the fine work accomplished by my fellow countrymen who have been officially responsible for the development of that region.

On this occasion, I have the honor to represent the Planters' Association of Malaya, who amongst them manage a total of upwards of 600 plantations, with an invested capital of about fifty million pounds sterling, a value, which through their efforts, has appreciated to several times that amount. I am quite certain that I should not be correctly voicing that community if I conveyed the impression that we would prefer any form of government than that approved by our Sovereign Lord, King George.

The success of our industry is largely due to the confidence inspired by the existence of an absolutely honest and conscientious public service. Mistakes have been made, but these have been due, entirely, to the excessive zeal of those in authority, who desire that the whole country should participate in the prosperity of our industry; and judging by past experience in times of adversity, we may reasonably expect that if our burdens become too grievous to be borne, we shall obtain the relief necessary to meet the stress of competition.

CULTIVATION.

With your permission I will now direct your attention to a few details connected with our plantation work.

At first, the cultivation was almost entirely confined to interplanting *Hevea* trees through the old fields of coffee, but a few bold spirits ventured to clear the jungle for this product only. But it is regrettable to mention that some tempered their rashness by planting rubber and cocoanuts in alternate lines, and had to pay rather heavily for their caution, by being forced to cut out either one or the other when both required more room for expansion. I need hardly mention that it was usually the cocoanuts that were condemned. As one who does not believe in keeping two good things in a parcel not large enough to hold both, I have planted the two products in adjoining fields; and, perhaps, for that reason, my feelings have always been harrowed by the woeful spectacle afforded by the destruction of thousands of these valuable palms.

The interplanting of *Ficus Elastica*—the red rubber of commerce (this has no connection with the rubber shipped from the Congo)—was at one time popular, particularly on the estates of the coast districts; but although this variety yielded a fair quantity at the first tapping, it did not compare at all favorably with *Hevea* in continuous yield, and the tapping seemed to check its growth. A considerable area remains under this variety in Sumatra, but it has become a negligible quantity in the Peninsula and has never been in favor in Ceylon.

At the outset we obtained our *Hevea* seeds from the original stock, and this was an expensive item, which has gradually declined in cost, now that we have trees of all ages and have no certain knowledge of any difference in the quality of the plants, whether raised from seeds of old or young trees.

In the hilly districts ordinary surface drainage is required but near the coast great care has to be taken to select land which can be drained efficiently, and this work frequently involves considerable expense. Fortunately for us, Malaya is not subject to tidal waves, as large areas of our finest plantations are only a few feet above sea level. The drains are laid out with the compass, and cut through the living jungle before felling. The jungle is then cut down and the branches lopped to a level of about 4 feet from the ground. A few weeks later, the burning is carried out by a line of men walking at ten to twenty yards apart, with their backs to the wind; and in favorable weather, the undergrowth and smaller branches are consumed. Afterwards the unburnt branches and small trees are piled and burnt, and generally speaking, when this is done the field is described as cleared, although the stumps and trunks of the big jungle trees still remain on the land. Recently on some estates, heavy expense has been incurred in getting rid of these, before planting, as a precaution against the spread of root disease and white ants. It is a debated point as to whether the risk of loss by disease justifies such expensive precautionary measures, and whether it is not better to wait for three or four years when the few rotten logs that remain can easily be got rid of.

Planting is done either from stumps or seed at stake. In the former case, the plants are taken from the nursery, being then from 6 months to 2 years or even older, cut to a length of 3 to 4 feet, the roots hacked back and then planted in the holes previously prepared for them. It says much for the vitality of the *Hevea* that it usually survives this drastic treatment and starts to sprout afresh, within a month, if the weather is propitious. From this time on ensues a battle between the planter and the original jungle, which endeavors to regain possession of the land. Numerous kinds of obnoxious weeds—coming from Heaven knows where—also make their appearance.

From time to time there crops up something almost as bad as weeds. I refer to the wearisome controversy as to whether it is

not desirable to allow grass to grow or to cultivate some cover plant which will extinguish the weeds. There are one or two cover plants which do not cause any permanent damage and have even proved beneficial on some plantations, when they have lacked sufficient cash to maintain a proper upkeep and when the only alternative was abandonment. I have experimented with small areas under grass, but the results have not shaken my belief in clean weeding, to be followed by digging or ploughing whenever there is a sufficiency of funds and labor. With a sufficient supply of these sinews of war, the planter can hold his own, and after three or four years, aided by the shade then afforded by his trees, he becomes master of the situation.

THE HARVEST.

The longed-for harvest then occupies his attention; and nowadays his thoughts turn, naturally enough, to the curing factory. When I started tapping, the word factory had not been invented, or, at any rate, used in this connection. I began by settling the latex in my washing basin, rolling the rubber with a beer bottle (an empty one) and drying it on the veranda. Then acting under strong domestic pressure, I moved the scene of operations to the stables, and carried it on there until there was no room for the horse. Next I built a little shed and bought a hand mangle. The next move was to the factory of today.

COST OF PRODUCTION.

You will, I think, be interested to hear something about the cost of production. We planters are frequently twitted about our old promises of cheap production and these are compared with actual costs, which in some cases exceed 60 cents (U. S. A. currency) a pound. The twitting, curiously enough, was most severe when rubber was worth from two to three dollars, at which time we had to pay an ad valorem export duty and charges, based on these extremely high prices. Then, as there were not quite enough experienced planters to go round, assistants, as well as managers, thought they would like to participate in the general prosperity and expected either larger salaries or else commissions. Our coolies also felt that what was good for master must be good for man, and demanded either more pay or less work—generally both. Even the government suffered from the prevailing spirit and on new applications increased the rent and charged a premium on the land. Shareholders often seem to forget to study the other side of the profit and loss account and to compare the price actually obtained against the price we figured on when estimating the cost of production. Moreover, we did not contemplate tapping our trees at four years old, at which age the rubber is naturally more expensive to collect.

I admit that I speak with prejudice, but it seems to me only right and proper that those responsible for supervision should enjoy some of the fruits of the industry, when the industry can well afford it. There are many other items of expenditure which will automatically decline when the value falls.

CLOSE VS. WIDE PLANTING.

I do not desire to encourage the expectation that the yields from our closely planted trees will approach that obtained from those first planted. The latter were usually planted at wide distances, and enjoy as much light and air as the heart of a tree can desire. Ten years ago, I collected 18 lbs. of rubber in 35 days from one of the trees planted by Sir Hugh Low; while from avenue trees of my own planting, 14 years old and 7 feet in girth, results have been obtained far in excess of those planted in the fields. It is for this reason that I am inclined to deplore references in published reports to yields *per tree*. All calculations should be based upon the yield per acre. Probably the average number of trees planted to the acre in Malaya is nearer 200 than 100, and thinning out is inevitable as the trees expand. Thus, your trees are an uncertain quantity, whereas the acre is always the same.

A well known botanist who studied the *Hevea* in its native land used to urge us strongly to plant at 40 x 40 feet, i. e., 27 trees to the acre.

The *Hevea*, like most quick growing trees, is extremely brittle; and, at this distance, would suffer severely from the wind, but if I allowed, for the sake of argument, that every tree reached maturity, I found by comparing the results from avenue trees against the results from closely planted fields that up to 8 years old I should have harvested less than half the quantity of rubber from the same area, had I adopted our botanical friend's advice.

It is true that I should have economised to a certain extent on the actual cost of collection but not sufficiently to compensate for the loss of rubber.

Thinning out as the trees get older and require more space, has been opposed on the ground that the dead roots encourage the spread of disease. I have pursued this policy for several years past and cannot find that the fear is justified. Indeed, as the years roll on, I become less anxious about plant diseases and pests of all kinds. *Fomes Semitostus* (our worst fungus disease) and white ants (the most destructive of our insect pests) have lost their terrors for me now that I know how to keep them in check; and as the loss from all causes on the plantations I am connected with does not average two per cent. after attaining maturity, I cannot, justly, be charged with "turning the blind eye" in that direction.

LABOR PROSPECTS.

The most plausible argument against the future output of plantations is that of shortage of labor. It is true that most plantations are at times short of labor, but I think this must generally be attributed to the manager's desire to keep down expenses. Out of a total of 227,985 coolies employed on Malayan plantations 126,665, or rather more than half, were imported from India. The average period of service on the plantation does not exceed two years—although many of these return after a holiday in their native land; and the difficulty is to engage during the recruiting season the exact number that are required to make good the probable departures during the rest of the year, without becoming burdened at the beginning with labor for which there is no profitable employment.

Within two years the plantation labor force has more than doubled. I do not believe that by increasing the rate of wages any great stimulus would be given to Indian emigration. Tamil coolies are more easily recruited for some plantations at half the wages paid on others which are unpopular, owing to unhealthiness or to some other cause; and this fact is becoming more clearly marked, since those employed at the lowest rates have found themselves able to remit more than half their earnings to India, and their savings in three or four years are sufficient to establish them as capitalists when they return to their native villages.

The future success of estates which are unpopular with Indians will depend on the attractions they can offer to Chinese or Japanese. To these, the rate of wages is of more importance than any other consideration; and there is practically no limit to the number that can be recruited—at a price.

It must be remembered that by doubling the cost of labor we do not double the cost of production. Generally speaking, the average cost of tapping is less than one-half the total cost of production, if we include home charges; and as the majority of the trees now being tapped have barely reached half their full yielding capacity, labor rates can, if necessary, be materially increased without raising the cost of production, when the trees attain maturity.

MANURING.

Recently, some consideration has been given to the question of manures. From Ceylon some interesting results have been reported, but in Malaya little has been done in this direction; except on some estates where the soil is excessively rich in humus, and lime has been applied to correct the acidity, with good results.

My own opinion is that for some years to come, at any rate, systematic cultivation of the soil will be of more value than any manure, but the experiments in Ceylon are deserving of atten-

tion; and the Agricultural Department of Malaya, if they have not already done so, might study the question with advantage.

FUTURE SUPPLIES.

It has been suggested to me that you will be interested in an estimate of the supplies that are to be obtained from plantation sources, and it is obvious that a paper of this kind would be incomplete without it. It is not easy to obtain reliable statistics of the cultivation in all the tropical countries in which rubber is grown. Naturally, the yields vary considerably and the high price has undoubtedly encouraged more vigorous tapping on many plantations than would have been considered advisable if the price had been less tempting. I know fields where from 800 to 900 pounds an acre have been collected for two or three successive years, but I question if such high yields can be maintained. A first-class, well-managed plantation may be expected to yield an average of 500 to 600 pounds an acre for as many years as our experience guides us, but we must assume a considerably lower average from all plantations. The area under rubber in the Malay Peninsula at the end of 1911 amounted to 542,877 acres, and as far as I can ascertain the total area under this cultivation in the world amounts to about 1,000,000 acres. We know that during the half year ending June 30, 1912, the exports from Malaya amounted to 9,038 tons, and from Ceylon to 2,252 tons. Allowing for the output from India, Sumatra, Java, etc., I estimate the total output of plantation rubber will be from 25,000 to 30,000 tons for the whole year. The annual increase will be fairly steady, and at about six years from date the production is likely to amount to 100,000 tons per annum or, in other words, equal the total consumption of rubber during the year ending June 30 last.

During the year ending June 30 (1912), with rubber averaging 5/2 (say a dollar and a quarter) a pound, consumption—according to the figures recently published by Messrs. Hecht—increased by 25,482 tons. I am aware that this statement has been challenged by other authorities. We are told that they are *eminent* authorities, but as they unfortunately published their views anonymously, we are obliged to take their word for it.

The most pessimistic of these that I have read, calculates the increase at about 14,000 tons, and if we accept this figure in preference to Messrs. Hechts' (I don't know why we should), and assume that this increase will be maintained, the requirements six years hence will amount to 184,000 tons, so that the struggle between plantation and wild rubber does not appear to be very imminent.

I have now told you as well as I can what I believe to be the immediate course of events. To you gentlemen, who are manufacturers, I would say this, whether our achievements will lead to prosperity for *our* industry will depend entirely on the growth of *your* industry. Speaking personally of my first few years' experience in tropical agriculture, I was engaged in planting coffee. At the outset of my career in this line, the price in local currency and weights was $40 a picul and I saw it fall to $16. This experience is put in the shade by that of my brother planters who were interested in pepper and cinchona. Our misfortunes were due to the fact that an increased supply did not lead to any considerable increase in the demand for these products. We have yet to hear of anyone who shakes the pepper castor more vigorously over his potatoes owing to a slump in the price of pepper, or increases his dose of quinine because the quantity of cinchona offered at the auction sale is in excess of anticipations.

The future of the rubber industry depends on whether the planter can confidently anticipate manufacturers digesting the increased supplies.

A well-managed, favorably situated, mature plantation can produce with a handsome profit at 2/6 (60 cents) a pound. It must be remembered that the increased demand depends on the new uses to which it may be put, the increased demand for uses to which it has hitherto been put, and the supply demanded by making good the losses by wear.

As an illustration of what I mean, I will take the case of solid and cushion tires which if not now, will perhaps shortly absorb more rubber than is used for any other purpose. If we assume that 1,000,000 of these tires are used through the world this year, and only the same number next year, the amount of rubber required on this account will, other things being equal, be only that amount necessary to replace the loss involved by wear and tear.

The irregularity of the cost has undoubtedly militated against its use in some directions. For instance, I am informed that whereas electric light mains and leads were in the past invariably insulated with rubber, paper insulation has been substituted in many cases. Experts tell me that rubber is preferable for this purpose, and no doubt a number of instances will occur to you gentlemen, where it would be preferable, if the price admitted of this use.

This brings me to the crucial question from the planter's point of view, and a question which my present audience is in a better position to make an authoritative reply to than any audience previously addressed by a planter.

We can guarantee an enormously increased supply of rubber and will in future years be content with a much lower price than now prevails. What we want to know is whether there is to be a glut in the market, and a scramble to sell, with every successive increase in the supply. Perhaps, gentlemen, you can allay the misgivings of those planters with the weaker faith in the future of the industry, and can send them, through me, assurances which will encourage them to hope for a continuance, even if in a modified degree, of the prosperity we have recently enjoyed—a prosperity which, I believe, has never been rivalled by any agricultural industry in all the history of the world.

MANURING RUBBER TREES.

EUROPEAN manufacturers and Asiatic importers of fertilizers have been zealously pushing their commodities with the planting public. The difficulty seems to lie in knowing which forms of manures are best suited to particular localities, and whether the outlay will be repaid by increased rapidity of growth or larger yield of latex. Experiments on the government plantations at Kuala Lumpur (Federal Malay States) established the fact that any kind of manure stimulated growth, and that lime was well suited for trees on the soil selected.

It is understood that further experiments are being conducted at Kuala Lumpur, and that a more extended series of trials will take place at Teluk Anson. While such experiments are of value from a general standpoint, the need has been pointed out of a certain amount of experimental manuring to ascertain the qualities best suited to individual estates. The opinion has been expressed that if fertilizers have anything like the effect on yield that they have been shown to have on growth, it may be anticipated that manuring will be largely adopted in Malaya.

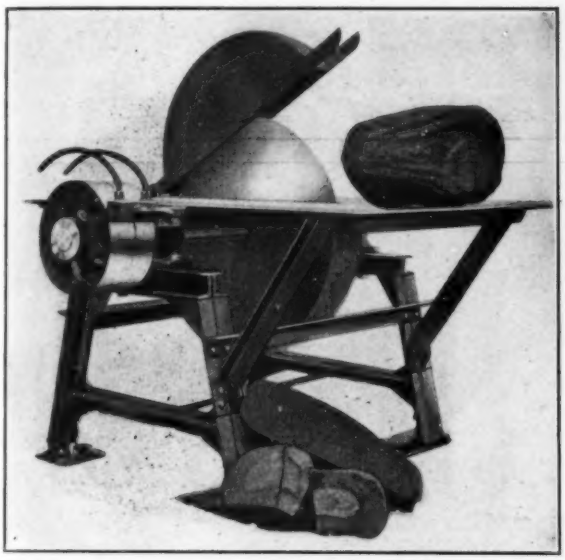
PARA RUBBER TREE IN CEYLON.

In the course of an interview with the Kandy representative of the "Times of Ceylon," Mr. H. A. Wickham, the father of the rubber planting industry, lately expressed himself as follows:

"The Pará rubber trees in Ceylon plantations are better than the trees in the Amazons, and I am not surprised at it. If you bring a product from one country to another possessing suitable conditions and cultivate it, the exotic will flourish in a remarkable manner. Take, for instance, coffee, an Eastern product which was introduced into South America. You will not get anything like the South American coffee in the East, and the yield is abundant. The coffee grows in Brazil better than in its native home. In the same way the Pará rubber tree introduced into the East from Western Equatoria, and finding favorable conditions, has developed in a remarkable manner. The trees here are much hardier than in their own country.

The Washing of Crude Rubber.

CRUDE RUBBER as it comes to the market appears in a great variety of forms—hams or pelles, balls, strips, sausages, lumps, flakes and all conditions of scrap. In all of these forms there is more or less foreign matter—matter that must be removed before the rubber can be used in manufactured goods. The foreign substances are bits of bark, leaves, splinters



KNIFE FOR CUTTING RUBBER BISCUITS.

of wood, sand, fibre, earthy matters, etc., etc. The only exceptions to this very general rule are deresinated and plantation rubbers. Many manufacturers find it worth their while to wash even these sorts, as the process seems to result in a better and tougher product. The primary process, whatever the line of rubber manufacture, therefore, is that of washing.

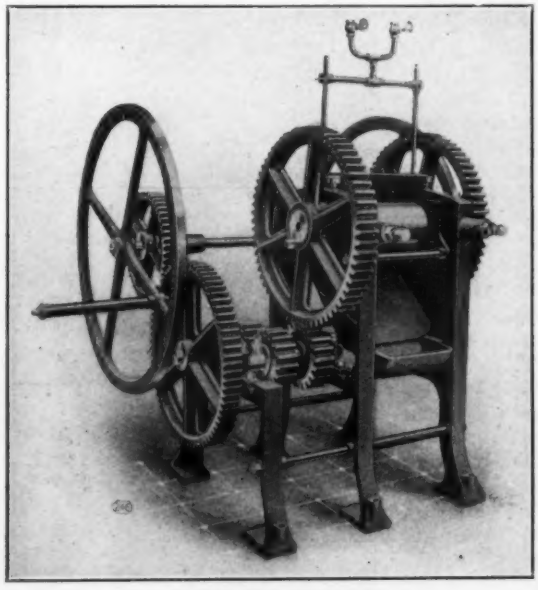
The gum is usually put into a pickling tank containing warm water, where it is allowed to soak. This removes foreign matter on the surface, softens the rubber and makes it more easily worked. This tank is usually sunk to the level of the floor near the washers to facilitate the handling of the rubber. For some grades, such as pelles of fine Pará, a power-driven circular knife is used for cutting the rubber into smaller pieces, that they may be more easily sheeted. The rubber thus prepared is fed into the first washing machine or cracker. The action of this machine is to tear or mangle the rubber, releasing the dirt and bark, which are washed away during the operation by a stream of cold water, which plays upon the mass. The cracker is a heavy, powerful, two or three-roll type of machine, the size and number of rolls depending on the quantity of material to be handled.

After a thorough washing in the cracker the partially cleaned rubber passes to the two-roll washer. The province of this machine is to complete the washing process and to sheet the torn rubber. Warm water is used on the tough mass to produce a degree of stickiness, that the action of the rolls may form it into sheets. Cold water is then turned on and the sheets passed through the rolls repeatedly until completely cleansed by the kneading action of the rolls and the running water.

There is a great variety of washers in use in the world's rubber mills, but a majority of them are of practically the same design; that is, they are usually two-roll machines, the rolls geared in different speeds and running toward each other. In rubber plantations practically the same type of a machine is used, run either by hand or by power, and in some of the larger plantations batteries of machines are employed. As plantation rubber is washed very soon after coagulation, the machine may be quite light and does not take nearly the amount of power to run that the same types in rubber factories call for. When it is remembered that crude rubber shrinks anywhere from 12 to 50 per cent., that while a considerable percentage of the shrinkage is due to the water extracted from the rubber, a great deal is foreign matter, more or less injurious to the gum, it will be wondered at that manufacturers have not insisted upon rubber being washed at the source of supply and delivered clean and dry, thus saving much in the way of freights. The explanation is that as soon as rubber is massed and its physical aspect changed, it is so easy to amalgamate the inferior and superior qualities that manufacturers decline to take the risk of being cheated, and have consistently frowned upon all such suggestions. There have been, however, and still are, crude rubber washing companies in various parts of the world that have done a fair business, but none of them have been conspicuously successful as yet.

There are some forty companies in the world making roll washers, and their patterns are more or less similar. It will, therefore, be sufficient, in describing these machines, to take examples from the output of any of the higher class of machine manufacturers and describe them as practically typical of the whole.

Roll washers consist of heavy iron rolls running toward one another, set in substantial iron frames, fitted with piping so that hot or cold water may be sprayed over the rubber as it passes between the moving rolls. These rolls, be it remarked, are



PLANTATION HAND WASHER.

fluted or corrugated so as to bite the often intractable and slippery gum.

Regarding the kind of roll—corrugation, many experiments have been made to determine the best possible form. There is for example the saw-tooth corrugation, in some cases both

rolls being cut to this shape, while in others one roll is smooth and the other cut. Probably more rolls are made with the V-shaped corrugation than any other. Experiments have shown that this form will do quite as good work at least, as it holds its shape longer and is easier to recut than the other forms. It seems to be quite a question whether two cut rolls or one (one being a smooth roll) will give the better results. There are cases where two cut rolls with ordinary corrugations make good sheets, but in small mills where one machine is required to do all the work from breaking down the biscuit to sheeting out, the machine with one smooth and one cut roll with a friction of about 1¼ to 1 in the rolls, is the better.

Taking a two-roll washer of the standard type, it has about the following description. The frames are heavy in construction, accurately lined and firmly held in place by stay rods. The frames are side-capped. The caps are bolted in place with heavy bolts in order to resist the strain at this point.

The journal boxes are solid cast, designed to keep out water and dirt. The bearing surfaces are channeled to insure perfect lubrication and bronze-lined in the sections exposed to greatest wear. Oiling devices easy and safe of access are provided.

The rolls are hard gray cast iron. The grooves or corrugations of both rolls are planed in spirally about 4 to the inch. The front or driving roll revolves in stationary boxes. The follower roll is brought into adjustment by means of steel adjusting screws, working in bronze nuts set into the back of the frames.

The power is taken from the main shaft by means of a jaw clutch and pinion. The latter engages a spur gear, keyed to the driving roll. A gear is keyed to the other end of this roll and meshes with a larger gear keyed to the end of the follower roll, causing the two rolls to travel at different speeds. The following are standard sizes of two-roll washers and their ten-hour product:

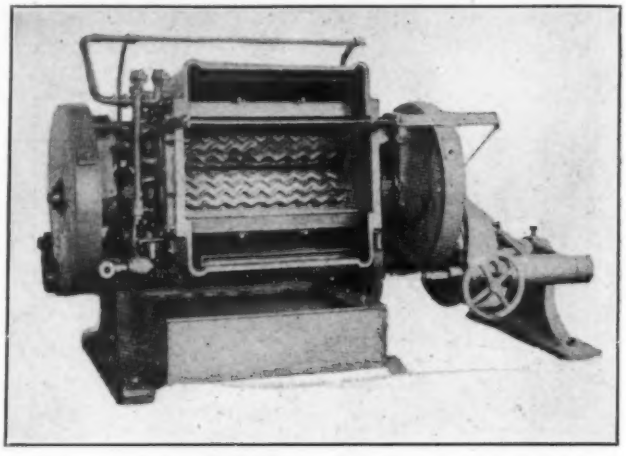
8 x 16″	2 roll	500	pounds	in	10	hours	7½ H. P.
10 x 20″	" "	750	"	"	10	"	10 H. P.
12 x 24″	" "	1,200	"	"	10	"	15 H. P.
14 x 28″	" "	1,500	"	"	10	"	20 H. P.
15 x 30″	" "	2,000	"	"	10	"	25 H. P.
16 x 36″	" "	2,500	"	"	10	"	30 H. P.

The cracker when used in washing is practically the same machine as the two-roll washer. It is, however, usual to have the rolls more coarsely corrugated, and of chilled iron. The rolls of the cracker run at the ratio of about 1 to 1½. A cracker-washer with rolls 15 x 24 should deliver 1,500 lbs. of stock in ten hours, and take about 25 H. P. to do it. One 16 x 30 should produce 2,000 lbs., and require 30 H. P. One 18 x 36 should deliver 2,500 lbs. and use 35 H. P.

The three-roll washer is designed to handle large quantities of rubber after it has been passed through the "cracker." It has a capacity nearly double that of a two-roll machine of corresponding size, while only one operative is required. The frames are heavy, strong, should be accurately squared as to each other and securely held in place by strong stay rods or bolts. The caps are located on the front of the frames to facilitate removal of the rolls. They are of heavy construction and provided with strong bolts in order to resist the powerful thrust directed against this part of the machine.

The journal boxes are solid cast, provided with oiling devices, easy and safe of access, and the inner or bearing surfaces are oil-channeled to insure perfect lubrication; so designed as to keep out water and grit. The bearing sections exposed to greatest wear are bronze-lined.

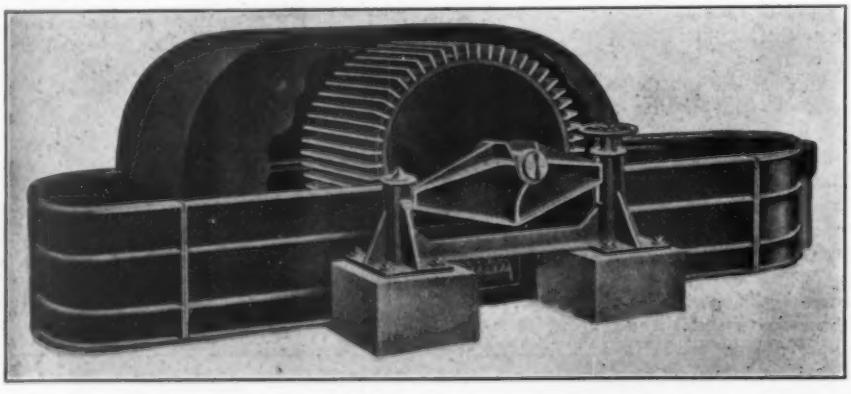
The rolls are usually solid cast of hard gray iron. The grooves or corrugations of all three rolls are V-shaped, planed in spirally about four to the inch. The front or middle roll is



MASTICATOR WASHER.

the driver and revolves in stationary boxes. The two follower rolls are brought into adjustment with the middle roll by means of steel adjusting screws, working in bronze nuts set into the back of the frames. Power is applied from the main shaft by means of a jaw clutch and pinion which engages a spur gear keyed to the middle or driving roll. A gear is keyed to the other end of this roll and meshes with gears of similar pitch and face, keyed to the ends of the two follower rolls; thereby all rolls are driven at the same speed.

Three-roll washers come in three sizes, weighing 15,000, 18,000 and 25,000 lbs. They have a capacity for ten hours' work in Pará rubber of 25,000, 35,000 and 45,000 lbs., using all the way from 50 to 100 H. P.



TUB WASHER.

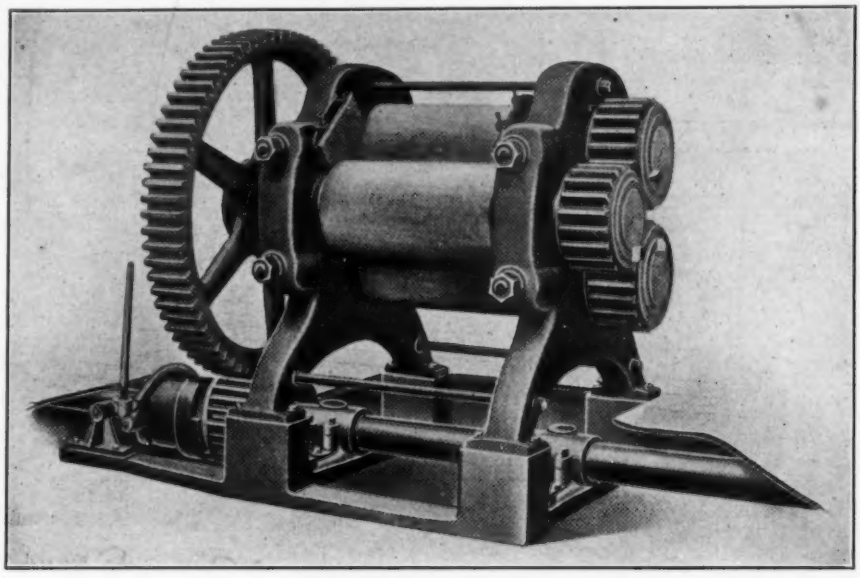
The three-roll cracker can be used as a cracker or a cracker-washer. For a cracker, the rolls are usually chilled and provided with coarse corrugations, such as the undercut or saw-tooth spiral shape with the face backed off, and the driving roll is geared to run 1 to 1½ or 1 to 2 as compared to the follower. A steel neck is also recommended for the driving roll.

The three-roll cracker-washer does the entire work from the biscuit or crude material to the clean sheet. The corrugations are usually the V-shape spiral on all rolls, but in some instances

the driving roll is corrugated and the follower rolls are smooth. The differential speed of the rolls is 1 to 1½.

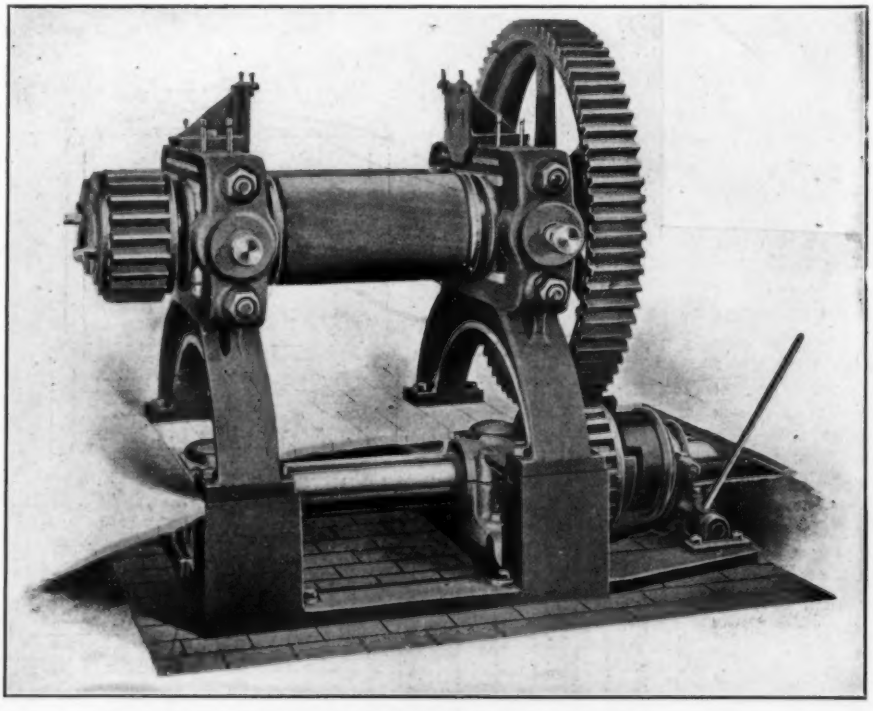
A distinct type of washer has grown up by the side of the roll machine, and is very generally used, particularly in cleaning the softer gums. It is known as the "Tub" washer and is very much like the so-called "paper engine."

It is in brief a tank anywhere from 2 to 16 feet long, with a beater wheel running in it. When filled with water and shredded material it runs the contents round and round the tank, beating and cleansing, and yet never crushing. In use the rubber is first run through a cracker of some sort and shredded. It is then put in the tub, which has been previously filled with water. When the machine is started the rubber is carried under the washing roll and over the bed plate at the bottom, which spreads and stretches the rubber and releases particles of sand or bark or other foreign matter. The bark, being lighter than the rubber, floats on top and is skimmed off, while the sand and gravel settle to the bottom out of the way and are removed after the batch is finished.



THREE ROLL WASHER.

For certain grades of rubber, where fine sand is present, this type of machine is indispensable. The type shown in the illustration is made of cast iron sections bolted together, and calked with lead. The bottom is built of cement or concrete, after the machine is placed in position. The bearings are set on piers outside of the tub with an adjusting screw on one side. The surface of the beating roll is fitted with steel-faced knives, set into cast-iron heads. The bed-knife is made of cast-iron and easily removed. The weight of a full-sized machine of this kind is about 12,000 lbs., and the beating roll 58" in diameter with 36" face. A tub of this sort will hold from five to six hundred gallons of water, carry from 300 to 500 lbs. of rubber per charge and take some 40 H. P. to run it.



TWO ROLL WASHER.

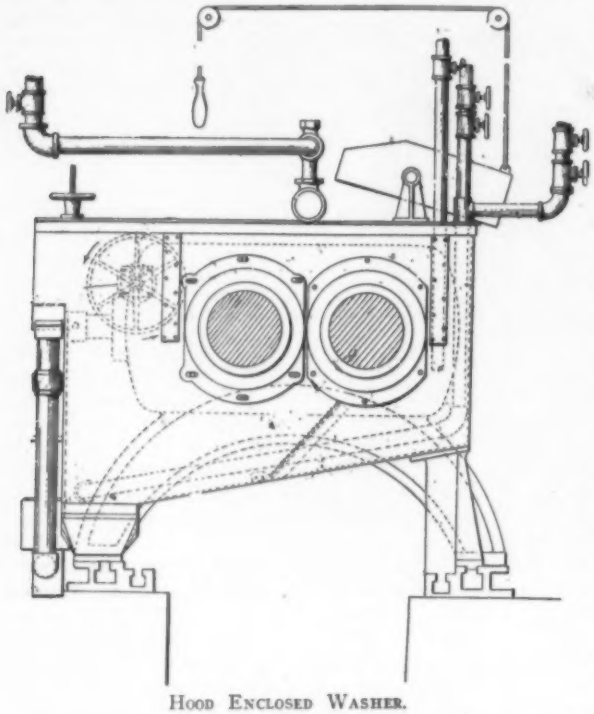
A type of washer which is essentially European, is an adaptation of a Masticator. The argument of the inventors of this type is that in ordinary washing with the two or three-roll machine, impurities are all crushed or splintered and held in the rubber, causing a much longer duration of washing than should be necessary, and that this impairs the "nerve" of the rubber. In the machine under consideration every particle of rubber is brought in contact with the water, and the water escaping carries the impurities away with it, at once.

The machine consists of a pair of deeply corrugated rolls, carried in a trough shaped at the bottom to follow the periphery of the rolls. The trough carries ledges at the back and front, which turn the rubber over and guide it between the rolls. The machine is furnished with gratings in the back and front of the trough, through which the lighter impurities escape.

This machine comes in three sizes, which take charges of rubber of twenty, forty and eighty pounds. The horse-power required is approximately 9, 15 and 25, and the time required per batch from ten to twenty minutes. The above relate to Pará sorts. For low grade gums

the charge may be as high as one hundred and fifty pounds.

What is known as the Hood washer is a two-roll machine set in a closed tank, so that the level of the water during washing



HOOD ENCLOSED WASHER.

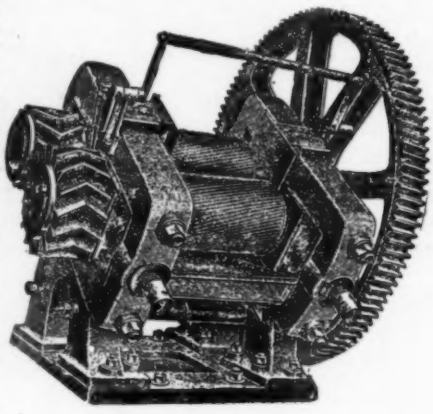
comes above the nip of the rolls. When at work the rubber sheet floats up to the surface automatically, and feeds through the rolls. Floating impurities are washed away, while the heavier ones sink to the bottom out of the way, and are removed periodically through a gate.

Another enclosed roll machine is the Dessau. It consists of a pair of rolls, corrugated and studded, revolving in a tank. The sides of the tank support a central screened box that immediately encloses the rolls. This gives a liquid space at the bottom and sides. There is arranged also at the bottom of the liquid space an agitating device which keeps the water in motion and is designed to prevent any particles of foreign matter from settling upon the rubber while it is being washed.

Still another enclosed washer is the Kempter, of German origin. This, like the Masticator washer, has bladed rolls, the bottom of the trough containing them being in the form of intersecting cylinders with a ledge in the middle. Water is forced in from the bottom. The rubber passes down between the rolls, is opened up by the ledge, and then up between the rolls and the sides of the trough. Foreign materials pass through perforations in the trough and over lips on either wall.

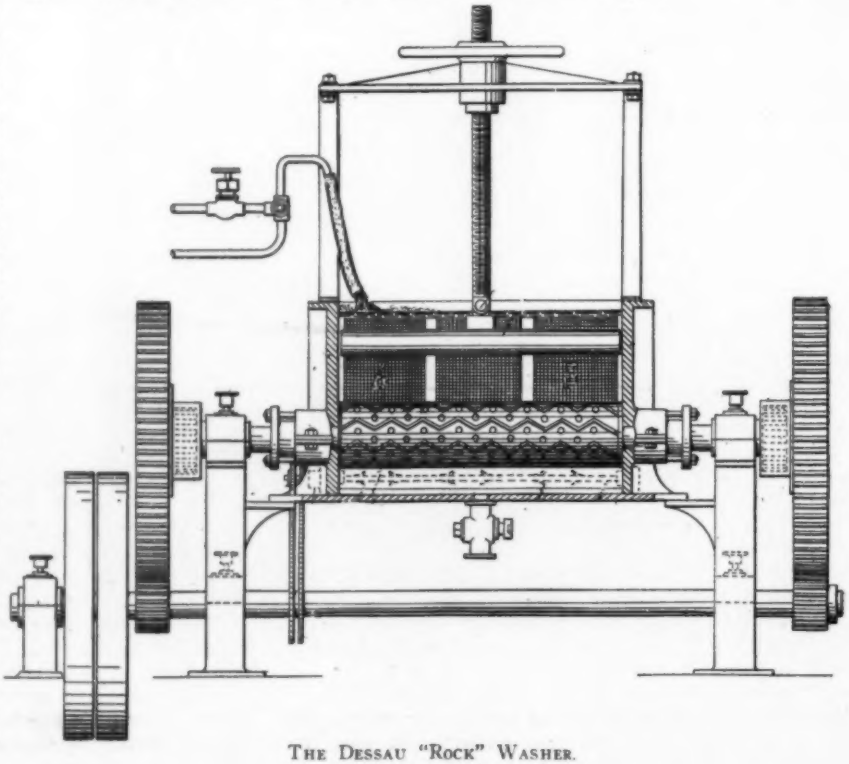
In addition to the foregoing there are sundry individual machines and processes in use in various factories for the further cleansing and treatment of crude rubber.

For example: In the production of a certain grade of rubber great difficulty was found in getting rid of the great amount of woody fibre that was present. After the rubber had been shredded, both rubber and wood floated on the surface of the water, and if put through ordinary roll washers much fibre was imbedded in the rubber. One solution of the problem was a method of dissolving the wood fibre by treating the mass with a strong alkaline solution. After many experiments a simple process for removing most of it mechanically was invented. It was this: to float the shredded rubber and fibre into a tank that could be hermetically sealed. Air was then forced in and the pressure freed the minute globules of air that clustered about each shred of fibre, and the shred, water-logged, sank to the bottom out of the way.



ANGLE TYPE TWO ROLL WASHER.

The above covers pretty fully rubber washing where water alone is used. Where rubber is washed free from resins, for example, and solvents are used, a radically different apparatus is necessary. That, however, is another story.



THE DESSAU "ROCK" WASHER.

Possible Rubber Producers in the Temperate Zone.

By Charles P. Fox.

A PAPER READ AT THE THIRD INTERNATIONAL RUBBER CONFERENCE, HELD IN NEW YORK, 1912.

THIS paper has been prepared at the suggestion of Mr. H. C. Pearson, originating from comments made upon an editorial in a recent issue of the INDIA RUBBER WORLD.

The idea of producing rubber in commercial quantities within the boundaries of the Temperate Zone is not a new one. The increasing use of this commodity and the increase in cost are responsible for the occasional stimulation of interest in the matter. Thirty years ago the farmers of Canada were forming companies for utilizing the common milkweed for this purpose. The high price of rubber in 1910, caused some Summit County (Ohio) farmers to seriously think of the same thing.

While the proposition is quite possible, its probabilities are remote, and dependent upon many conditions, some of which are: demand, cost of production, grade of product, influence of supplies of natural and plantation-grown rubber and the ever-appearing spectre "synthetic."

We have several rubber-producing plants suitable for the various sections of the temperate zone. During the past fifteen years the author has examined a number of plants, the examination including almost every plant likely to contain rubber, from Carolina Palmetto to California Cactus. For convenience I have grouped these plants according to their nativity and climatic requirements.

Of the foreign plants we have *Atractylis* and *Eucommia*.

Atractylis gummifera is a thistle-like Composita of Southern Europe with enormous beet-like roots and thorny leaves. A few years ago European writers advocated this plant as a source of crude rubber. Our examination did not confirm this view.

Eucommia ulmoides, known as the "Chinese Rubber Tree," is a native of Northern China, a country very similar in soil and climate to Eastern Washington. According to the Arnold Arboretum, Harvard College, it is perfectly hardy in New England. Just what it will do in this section in the production of rubber either in quality or quantity, is not given out by the authority quoted. Under natural conditions, it produces a good rubber, the rubber appearing as long silky threads in the broken bark. This source of rubber has been known since 1882. It has been recommended for planting by the Indian Forestry Commission. According to Vilmorin, Paris, who propagated it for sale, there was never much demand for it. It is a fine appearing tree and well deserves a place in ornamental forestry.

Of our native plants those of possible value as rubber producers in the North are members of the *Asclepiadaceae, Apocynaceae,* and *Compositae* families.

Of the true milkweeds there is only one of any importance, *Asclepias cornuti.* This species is very abundant throughout the United States, growing upon almost any kind of soil and showing great drought-resisting qualities. This plant contains an abundance of milky juice containing 3 per cent. of fair grade rubber. The cost to collect this latex is, however, prohibitory. The amount of product given up by extraction of either the fresh or dried weed is too small, and its character too inferior to command much attention.

If by selection or transportation from one section to another, the quantity and quality could be increased and improved to a degree sufficient to make the production by extraction profitable, this plant would be the favorite, as perennial plantations yielding annually 2 to 3 cuttings of at least 10 tons each per acre of green weed, could be easily and economically established.

The common Indian hemp, *Apocynum cannabinum,* occupies about the same territory as the milkweed but is less abundant. It produces less latex than the milkweed, but the quality of rubber is better. The root of this plant contains rubber, and is very similar to that of the African *Landolphia.*

The native *Compositae* of this region give us several rubber producers. *Souchus* (Sow thistle), an introduced species now naturalized, is credited by Jumelle as the producer of an excellent grade of rubber. *Souchus* rubber is the subject of a German patent of 1885. This plant thrives on a dry, barren soil and is regarded as a troublesome weed.

We have two species of wild lettuce, *Lactuca Canadensis* and *L. virosa;* both very abundant, especially the latter, which is a terrible pest. Both produce thick rubber-containing latex and medicinal agents. *L. virosa* gives a water extract similar to chicory as a coffee substitute.

The arid section of the Temperate Zone is amply provided for with guayule, pingue, greaseweed and candelillia.

The value of the guayule (*Parthenium argentatum*) as a rubber producer is too well known to need a description. Prof. Lloyd is certain that guayule can be successfully grown in Mexico. Mexican conditions can certainly be duplicated in the Southwest.

Pingue (*Actinella Richardsonii*) is a related plant found in New Mexico and southern Colorado. While containing less rubber than guayule, it possesses some superior advantages in other ways. The root of the pingue is the producing portion. The top furnishes numerous shoots for propagating. The pingue requires a deep, sandy soil for the maximum development of its long tap root. Under these conditions the yield of rubber may reach 7 per cent. of good grade rubber equal to, if not better than, the guayule product.

While investigating the pingue, this peculiar condition was observed: As before stated, the pingue, under natural conditions, i. e. mountain slopes and dry sandy banks, develops a fusiform type of root, comparatively rich in rubber. On clay soil, in meadows along irrigating canals, the pingue root becomes fibrous and contains little or no rubber. This phase may have an important bearing upon the utilization by cultivation of the guayule and pingue for the production of rubber.

The neglected mariola, another *Parthenium,* occupying a wider range and much more abundant than guayule, may sometime be of value on account of its resin. Nevada greasewood contains rubber as shown by the Ellis & Werner patents of 1902. Mr. Sam P. Davis, Nevada Industrial Commissioner, advises that there is a large amount of this plant.

Another promising plant of the arid region is "Strockles Rubber Bush," a robust *Composita* growing abundantly throughout the Great Basin. While the rubber of this plant is inferior to that of the other two *Compositae* mentioned, it can be utilized. This plant also contains a large amount of valuable resin.

In North Mexico and the "Big Bend" country of Texas, there is an immense growth of Candelillia, an *Euphorbia* which contains rubber and wax. This wax is now a commercial product much used in Germany as a constituent of hard rubber. On account of its drought-resisting qualities and the facility by which it can be propagated by its bulbous root, it should be a valuable plant for the extremely arid, non-irrigated section of the Southwest.

The South has its special rubber producing plants. Some 15 years ago the growing of *Ficus elastica* for rubber was attempted in Florida. The point selected, unfortunately, was on Key West, a small island near the mainland, with shallow soil and dry meteorological conditions.

The venture was not successful. The ruins of the plantation with its dwarfed, straggling trees still remain. The trees are now 15 to 20 feet high and 6 inches in diameter. Some of these trees were tapped in April, 1910. Very little latex was secured and this was of poor quality. When grown on the mainland, in the deep, fertile and moist soil near Miami, it becomes a large tree.

There is a native fig (*Ficus aurea*) found growing abundantly throughout southern Florida. Large trees, 60 feet high and 2 feet in diameter, of this species, are to be seen on the grounds of Fort Dallas, once the prison home of the defiant Seminole chieftain, Osceola.

Mr. Flagler, the founder of Palm Beach, planted this species along the shores of Lake Worth for ornamental purposes. The tree gives an abundance of latex containing rubber, of quality

CHARLES P. FOX.

probably as good as the Amate rubber of Mexico. The tree will flourish in almost any situation found in South Florida.

That portion of Florida south of Homestead is a vast stretch of saw grass, with swampy clay of doubtful value for agricultural purposes, even after the "Everglade Reclamation" has been completed. The Florida fig will grow there. Considering the large area suitable, the rapid growth of the tree, and the possibilities of the yield of rubber, the proposition is not the worst one.

In the sandy and drier portions of the South, we have several species of *Bumelia*. Tropical relatives of the *Bumelias* are producers of gutta percha. Texas "stretchberry" (*Bumelia lanuginosa*) contains rubber. The "stretchberry" is a shrub of wide distribution suitable for much of the waste land along the Pecos.

In the arid portions of the South, especially on the Florida Keys, the hedge spurge (*Euphorbia triangufolia*) does entirely too well. Planted out originally for fencing, it has, in many localities, spread into the fields. This plant produces a small amount of rubber. Recently, it has been strongly advertised as "Cuban Rubber." Value of the plant as a rubber producer has been over-estimated.

Of the several plants mentioned for the possible production of rubber in the Temperate Zone, only two of them, guayule and pingue, have been found to contain enough rubber to insure a profitable working. The balance must be improved by careful "Burbanking." This work of selection and improvement lies within the scope of our experiment stations. Already the universities of New Mexico and Arizona have work in progress along these lines.

In the possible production of rubber in the Temperate Zone, the arid West has the better chance, with the South a close second. While the Temperate Zone may never do much in the way of producing first class rubber, the firm believer may find consolation in the prophecy that, if necessity demands, it can produce enough masticatory to keep busy a hundred million maxillae.

CHARLES P. FOX.

ONE of the most fascinating studies connected with the botany of the United States is the possibility of cultivating, on a commercial scale, some rubber-producing plant. Probably nobody has given more attention to this matter than Mr. Charles P. Fox, whose interesting paper, "Possible Rubber Producers in the Temperate Zone," appears above. Mr. Fox has studied the question of rubber producing plants in the United States for the last fourteen years, and studied it in a thoroughly scientific way. He is an Ohioan by birth, graduated from the Ohio State University in 1890, and very soon thereafter became Professor of Agriculture in the University of Idaho. From 1899 to 1912 he was chemist with the Diamond Rubber Co., and since the merger of that company with the Goodrich company has acted as chemist for the larger corporation.

He has devoted a great deal of time to investigating the source and preparation of Guayule, Jelutong, Colorado rubber weed, Castilloa, the Cuban cactus and Florida fig rubbers.

He is a member of a number of scientific societies, including the American Chemical Society, Society of Chemical Industry and the National Geographical Society; and he has published many pamphlets and articles relating to agricultural and rubber industries.

RUBBER SEED OIL.

UNTIL recently the demand for seeds for planting purposes has absorbed a considerable portion of the supply, but as the "Malay Mail" remarks, this is no longer the case, and every year will see a larger quantity produced. In order to make the industry remunerative, it would probably be necessary to extract the oil from the seeds in Malaya, which would involve the putting in of costly and delicate machinery. As the quantity of seeds on even a large estate would be relatively small, and as it would possibly not pay individual companies to buy and work the necessary plant, it is suggested that groups of estates, or a syndicate, might carry out the idea profitably.

CONGO CONDITIONS VASTLY IMPROVED.

The Congo Reform Association of London has recently presented a memorandum to the effect that the conditions in the Congo, barring one district, are greatly improved over those which prevailed under the administration of the late Leopold. The memorandum states that there is still one district where many barbarities are practised, and suggests that the present Belgian administration should send an official of experience and character to work in conjunction with the British Consul, to ameliorate the conditions in that district. The following paragraph taken from the report will be pleasant reading to all those whose sensibilities in the past have been so keenly aroused by the reports from the Congo:

"Systematized, officially directed and inspired enslavement of the people, accompanied by brutalities, violence and torture as a fixed, definite policy for purposes alike of public revenue and private profit, has disappeared from five-sixths of the Congo.

"That these results are due to the leading part played by his majesty's government and by the people of this country, in a wholly unselfish effort to restore to the unrepresented races of the Congo the liberties and rights of which they had been deprived, history will bear witness."

The Purchasing Agent.

*By Frederic Dannerth.**

IN this twentieth century, with our schools of scientific salesmanship and correspondence courses galore, for those who purpose selling commodities, may we not hope soon to have an institute for the training of buyers—the men who purchase the raw materials for our manufacturing establishments—the men who have so frequently been accused of receiving gratuities and similar forms of "rake-off." And if you examine closely you will probably find that the accusers are receiving more spoils and "graft" than the most prosperous buyer has ever dreamed of.

At a time when strikes are the order of the day, when the supply of coal, of textiles and iron products may be cut off without further notice within twenty-four hours, it becomes most necessary for this official to scent from afar-off the delays incident to labor troubles. He must take care to lay in a goodly store of those materials which his factory needs most, in order to keep its various shops in operation. Then again when his requirements are less than the monthly allotment called for in his annual contract, the buyer must be able so to conjure the situation that the vendors—his supply houses—do not hurry him or "saddle" him with excessively large shipments. Another point which must be constantly kept in mind is the large amount of storage space required for goods which are ordered in carloads and used by the pound.

One phase of purchasing which comes into play more frequently among importers and jobbers, is due to the quadrennial prospect of tariff changes. This possible revision makes it necessary to keep in touch with the new administration and the desire on the part of the party in power to raise or lower the import duties on certain commodities. The arrival of importations ten hours after the tariff act goes into effect is a familiar spectacle at custom ports, and one which brings forth sadness or cheer in the heart of the importer, depending upon whether the duty has been advanced or lowered. One other point which the buyer usually keeps before him when placing orders is: the possibility of delay in shipments due to spring floods and excessive snowfall on railroad lines, or fires and strikes at the shipping point.

A well organized purchasing department is characterized by the specialization of duties—an arrangement by which the shifting of responsibility is eliminated, or at least reduced to the minimum. Thus the chief buyer with his assistant counts among his duties:

Interviewing the representatives of vendors;

Visiting the trade markets and manufacturing plants;

Watching trade tendencies and prices of raw material, .

Checking his monthly consumption of each raw product, and noting the daily consumption of the principal materials. The time spent on these "incidental" duties and the accuracy with which they are performed will determine to a large extent the efficiency of the purchasing agent's office. To purchase profitably, comprehensively and safely, the buyer must be not only a judge of values but he must likewise be familiar with every line in the market, for it is obvious that the farther his knowledge in this direction extends the greater will be the choice open to him. The buyer must be a man of judgment and convictions, for he is frequently consulted by the head of the firm and must be able to back up his opinions with good reasons. Thus he is constantly being put on the defensive, for no corporation head will be so irrational as to O. K. every expenditure, however large, without inquiring into its advisability. A buyer's duty is not to do the small things himself, but to see that they are done; and to that end he should hold the reins on all branches of his department. He can take nothing for granted; if he would know his materials he must see them, and even this is but a test of the shape, smell, color and taste of the article. In other words, he can determine off-hand only those properties which cannot be expressed by numerical values, properties which are ascertained by the senses of sight, smell, taste and touch. Hence we find that those materials which are used in chemico-engineering industries—materials which are valuable entirely or partly because of their chemical and physical properties, must be tested by one who is familiar with laboratory methods for making exact determinations.

Thus the amount of actual "tannin" in a tanning extract; the amount of free caustic alkali in a silk-dyeing soap; the amount of "active chlorine" in the paper-makers' bleaching powder; or the amount of adulteration in antimony for rubber goods manufactures—determinations such as these must of course be made in the testing laboratory, which is attached to all properly organized purchasing departments. These chemical tests are supplemented and sometimes preceded by the physical tests for specific gravity, viscosity, tensile strength, elasticity, hardness and dimensions.

In addition to the testing laboratory, the buyer has under his supervision the clerical room and the receiving room. In the first of these all requisitions for the purchase of machinery, chemicals, or departmental supplies are filed and passed upon. Bills of lading, invoices and statements are likewise inspected and passed upon in this branch of the department. Here also is kept an accurate card record of discounts, terms and the responsibility which each vendor guarantees or assumes. The original copy of "Specifications for Materials Purchased," which have been drawn up by the head of the testing laboratory, is likewise kept on file in this office.

In the receiving room we find the warehouse foreman and the receiving clerk, who receive shipments and make a physical inspection of each article with reference to dimensions, weight, number and size.

In the testing room or laboratory, samples of all shipments are received and subjected to such tests as will determine whether or not the delivery complies with the standard of quality set forth in the contract or specification. All these duties, as a rule, fall to the lot of the buyer's chemist, who in turn acts and cooperates with the factory chemist, the engineering chemist and the sales chemist.

After having thus briefly reviewed the duties of the buyer and the functions of his several assistants, it will be of interest to consider a few phases of his work, which at times bring him in closer contact with the laws of business and the courts of commerce.

A casual inspection of the court decisions in the various States of the Union shows at a glance the confusion which has arisen from the fact that buyer and seller did not understand each other, and it is for this reason chiefly that so much time and energy have been spent in recent years on the preparation of rational specifications for the purchase of materials. (See also THE INDIA RUBBER WORLD, January and February, 1911.) Among the topics which are of interest in this connection are: "What is the legal meaning of the word 'agreement'?" "What constitutes the acceptance of a proposition?" "What constitutes a sale?" "How should contracts be constructed and how are they

*Dr. Dannerth has for a number of years been acting as advisory chemist to various rubber goods manufacturers.

interpreted by the courts?" These points will be taken up in detail in the paragraphs which follow.

AGREEMENT.

In order to make an agreement which shall be valid in the eyes of the law, it is essential that all the parties to it agree upon the same thing in the same sense. For example, a promise to deliver "good quality Pará rubber" cannot be construed to mean "fine Pará rubber," as fine Pará implies a grade of rubber superior to those grades which might ordinarily be accepted as "good quality." Again, if a buyer orders ten barrels of antimony sulphide on 60 days' credit and the vendor or merchant sends two barrels on 30 days' credit, the goods if lost on the way need not be paid for by the person sending the order. In construing a contract, the court takes into consideration the honest and actual intention of the parties as expressed in the contract. The common law, or that which prevails on the authority of usage and the decisions of courts, plays a very important role in the adjudicating of disputes on contracts.

ACCEPTANCE.

The surest and most binding form in which to accept an offer is to use a simple affirmative, without stating any new conditions or terms. Thus, goods which were sent as directed by the buyer, and which were lost on the way, had to be paid for by the purchaser. In the matter of offers which are not accepted at once, Parsons notes that it is not necessary that the acceptance should follow the offer instantaneously. If "A" makes an offer to "B," the latter may take time to consider this offer, and, though "A" may expressly withdraw his offer at any time before acceptance, yet, if he does not do so, "B" may accept within a reasonable time. And if "B" accepts, "A" cannot say, "I have changed my mind." "A" may, if he so desires, stipulate a certain time for which his offer holds good; in fact, this is a safeguard very frequently adopted by merchants when offering materials for sale. A factor may offer goods for sale at a certain price, the offer to hold good for 30 days. This offer may be withdrawn at any time before the expiration of the 30 days, but if it is not withdrawn, the factor is bound to sell the goods at the price originally mentioned by him.

TRADE CUSTOMS.

A very large part of the mercantile law of the present day is the product of old established trade customs which have been recognized as valid by the various trades and professions, and which have been confirmed as reasonable by the courts. The Supreme Courts of several States have repeatedly refused to recognize as "trade custom" any practice which is opposed to the statute laws of the land, or which is oppressive and unreasonable. In the same manner, a custom which violates the principles of common honesty and the public welfare, will not be recognized by the courts. This, it will be seen, is of interest in cases involving such questions as: What is meant by a "barrel," or a "cask," or a "case"? Thus a contract for the delivery of "cotton" without any qualifying phrase made it possible for a mill to deliver a fabric made from "sick cotton" (abnormal cotton), as there did not appear to be any well-defined trade custom covering the point.

WHAT IS AN ACTUAL SALE?

An actual sale is always understood to be a contract which has been executed, although payment for the chattels or the delivery of the same may not yet have been made. A sale is the exchange of goods for money. An exchange is the transfer of chattels for other chattels. Thus, if the ownership in a thing be transferred to another person for money (or a price) a sale has taken place. Thus, if Smith agrees with Blank that the ownership in a certain property will be transferred to Blank for a fixed price, an agreement and a sale have been consummated and Blank owns the property wherever it may be.

"CAVEAT EMPTOR."

"Let the buyer beware": that is the warning which the law gives to all who trade and it is one which is only too often unknown, forgotten or neglected. If an article is offered and a sample of that article is submitted, the vendor thereby warrants that the goods will conform to the sample. If then the delivered goods do not correspond in quality with the sample, the buyer may sue for the breach of warranty. When the buyer orders an article and specifies the purpose for which it is to be used, the supply house which fills the order implies a warranty when it supplies the goods to the buyer. Thus if the buyer receives a sample of 98 per cent. magnesium oxid and places an order based on the sample, and then receives a shipment consisting of 25 per cent. magnesium carbonate and 75 per cent. magnesium oxid, the supply house is liable to damages for losses which may arise from the use of the impure magnesium oxid. In this case it is important that the buyer convince himself through a chemical test that the sample is actually 98 per cent. pure magnesium oxid. Again, if the buyer can show that the seller contemplated fraud when closing the contract, that contract will be held to be null and void. On the other hand, a thing which cannot be proved is equivalent to a thing which does not exist.

INDIA-RUBBER GOODS IN COMMERCE.

EXPORTS FROM THE UNITED STATES.

OFFICIAL statement of values of exports of manufactures of india-rubber and gutta percha for the month of February, 1913, and for the first eight months of five fiscal years, beginning July 1:

MONTHS.	Belting, Packing and Hose.	Boots and Shoes.	All Other Rubber.	TOTAL.
February, 1913.....	$182,997	$103,906	$644,077	$930,980
July-January	1,583,069	973,423	4,695,696	7,252,188
Total, 1912-13....	$1,766,066	$1,077,329	$5,339,773	$8,183,168
Total, 1911-12....	1,491,121	1,139,181	4,640,177	7,270,479
Total, 1910-11....	1,354,060	1,699,371	3,899,406	6,952,837
Total, 1909-10....	1,233,910	1,437,252	3,053,753	5,724,915
Total, 1908-09....	896,362	1,013,544	2,454,707	4,364,613

The above heading, "All Other Rubber," for the month of February, 1913, and for the first eight months of three fiscal years, beginning July 1, includes the following details relating to tires:

MONTHS.	For Automobiles.	All Other.	TOTAL.
February, 1913.....*values*	$276,253	$367,824	$644,077
July-January	2,050,843	2,644,853	4,695,696
Total, 1912-13.....	$2,327,096	$3,012,677	$5,339,773
Total, 1911-12.....	1,641,373	349,372	1,990,745
Total, 1910-11.....	1,194,720	368,029	1,562,749

BAKELITE PATENT RECOGNITION.

As a result of negotiations between the General Bakelite Co. and the Condensite Co. of America, the suits brought by the former against the latter and its customers for alleged infringement of the Bakelite patents, have been withdrawn, and the Condensite Co., recognizing the pioneer character of Dr. L. H. Baekeland's work, has acknowledged the validity of the Bakelite patents in suit and some others, and will pay substantial royalties thereunder.

The General Bakelite Co. will continue the manufacture of Bakelite under its numerous patents, and the Condensite Co. will manufacture Condensite under the Aylsworth patents, as well as the license just granted for such of the Baekeland patents as are broad enough to cover Condensite.

The Akers Rubber Commission in the Amazon Valley.

THE second volume of the English Akers Commission report, dealing with the Amazon Valley, forms a suitable continuation of the first volume (reviewed in the May issue of the INDIA RUBBER WORLD, page 417), which dealt with the work of the commission in the Orient. Many points treated in the earlier report were of a general character, requiring to be kept in view in the consideration of the later record; the two volumes forming an unusual instance of comparative investigation, at the chief points of rubber production of the eastern and western hemispheres.

From the commission's estimate of the world's rubber production for 1912, it will be recalled that the grand total of 105,000 tons included: Brazil, 46,600; other South American countries, 2,000; Mexico and Central America, 3,000; the total for the western hemisphere thus being 51,600 tons. The eastern hemisphere contributed about an equal quantity: Oriental plantations, 31,000; Africa, etc., 22,400; making an aggregate of 53,400 tons. These two amounts together constitute the grand total of 105,000 tons for 1912. An estimate for the ensuing seven years, presented at the same time, showed a prospective increase of the yield of Oriental plantations, from 31,000 tons in 1912 to 302,450 tons in 1919. Hence the question arises whether, and in what proportion, the Brazilian supply is likely to be increased during the same period. To define actual and prospective conditions, was the object of the visit to Brazil of the Akers Commission; in which that body must be considered as having achieved a relative success, seeing that its labors in the Amazon Valley only extended to a period of less than three months, from the beginning of last August to the end of October last. That its work was fruitful in results is shown by the fact that while the report of the four months spent in the Orient fills only 89 pages, that of the three months in the Amazon Valley takes up 164 pages, and is supplemented by 26 pages of illustrations, representing various features of Brazilian rubber cultivation and kindred subjects.

OBJECTS OF THE INVESTIGATION.

As stated in the May issue, the objects of the commission included the investigation of the general condition and prospects of agricultural industry, and the endeavor to find improved methods of administration, collection and preparation, in order to enable Brazilian rubber to compete with that from the Orient; as well as the placing of labor in the Amazon Valley on a cheaper and more effective basis. In connection with the last named question, were those of the colonization of waste lands, and the establishment of experimental plantations or farms.

The party left Pará on August 20 for their journey up the Amazon to the rivers Madeira and Purús, to carry out their investigations. They made the voyage in the new stern-wheel steamer "Curityba," of the Mosquito fleet, which had been specially fitted out for their use. Mr. C. E. Akers had already visited the rivers Mojú and Guamá, pending the arrival from Europe of his colleagues, Mr. H. C. Rendle and Señhor F. Lugones.

The voyage up the Amazon and many of its tributaries (practically as far as steam navigation was possible), was both interesting and instructive, the commission having covered about 7,000 miles of river, inspected close upon 50 estates, and seen rubber and cacao of all ages and sizes, growing under every conceivable condition.

THE LOWER AMAZON VALLEY.

The lower Amazon section of the Amazon Valley includes the district served by the Bragança Railway, all the islands of the delta, and the rivers Mojú. Guamá, Xingú, Tapajós, Maicuru, Canumá, Jary, Paru, Curua, Trombetas and many smaller streams; as well as the land on both banks of the Amazon as far as Manáos. This vast area can be divided into three distinctive zones: (1) The islands, where rubber is largely collected by residents or squatters on their own account, to enable them to purchase the necessaries of life; (2) the various rivers, where the rubber is collected on the system of half shares between the collector and owner of the lands; and (3) the country on the banks of the Amazon as far inland as Manáos, where the principal industry is cacao, rubber taking a place of secondary importance.

Dealing with the separate rivers, it is remarked that on the Tapajós all enterprises is practically confined to rubber production, the cry of agents and owners in Pará being always for "rubber and more rubber," and any form of cultivation of the land being discouraged from headquarters. One reason of this opposition is said to be the fear of the owners of large estates that their profits from the stores would be diminished if the laborers were allowed to cultivate mandioca, maize and beans on their own account.

Nowhere in the course of their investigations did the commission find a greater wealth of rubber trees than on the islands and shores of the Xingú, the proportion of untapped trees being very large. Fine old trees of big girth were to be found at no great distance from the banks of the river. An important factor in the trade of the Xingú, is the through traffic in rubber and caucho from Matto Grosso, which would be materially aided by improved means of transport, existing methods by canoes and on muleback being costly and slow.

Rubber is practically the sole industry of the Tocantins river, the facilities thus afforded for gaining a livelihood having driven out other forms of agriculture. Large quantities of rubber trees are to be found on the river banks and islands; a large proportion of which have been worked many years, and damaged by the use of the *machadinho* or rubber collector's axe. This damage has, however, been confined to a great extent to the lower part of the trunk, and it is anticipated that much latex can still be extracted by overhead tapping. As, moreover, a large number of young trees are approaching maturity, there is small likelihood of the supply of rubber being exhausted for many years to come.

THE UPPER AMAZON VALLEY.

The most important rivers of the Upper Amazon Valley are the Madeira and the Purús, and it is to these that the commission has devoted special attention in its report.

The river Madeira, which flows into the Amazon about 100 miles below Manáos, is formed by the junction of the rivers Mamoré and Beni, which flow through Bolivian territory. After the confluence of these two rivers into the Madeira, it forms the boundary line for about 100 miles between Bolivia and Brazil, and then takes its course in a northeasterly direction for 850 miles, until it merges into the Amazon.

At flood time it is navigable for ocean steamers of 22 feet draught as far as Porto Velho (a distance of 635 miles), and for those of lighter draught at all seasons. Above Porto Velho are a series of rapids, which only allow the passage of flat-bottomed boats or canoes. It was to facilitate communication with Bolivia around these rapids, that the Madeira-Mamoré railway was constructed.

Virtually the only industry on the river Madeira is rubber production, agriculture being discouraged by the proprietors of rubber properties, in order to force the rubber collectors to purchase all they require from the general stores, which yield enormous profits. Rubber plantations, in the proper sense of the term, can be hardly said to exist. The Madeira is the most

prominent factor in the prosperity of the Amazon Valley. Its territory contains great numbers of the best variety (black) of rubber trees, while the quantity and quality of the rubber exported from that district are most noticeable features in the markets of Manáos and Pará. It provides the outlet for rich districts of Bolivia, and the excellent soil on its banks is capable of development in many branches of agricultural industry in the future. The climate, moreover, is such that it presents no obstacle to European colonization.

The river Purús flows into the river Solimões, 200 miles west of Manáos; the distance from that point to the confluence of the river Acre and the Upper Purús being 1,065 miles. For the first 600 miles, it is navigable the year around for vessels drawing 15 feet.

Rubber forms practically the only industry of the Purús river. It is entirely collected from forest grown trees, the few attempts at planting having proved failures, or not having yet come to maturity. It is remarked that many of these rubber properties are of very great value, or would be so if developed on intelligent and reasonable lines. On one estate containing over 200,000 fully grown trees, only 25 per cent. are worked, and these are being hacked to pieces by the use of the *machadinho*. Such a property, it is added, in competent hands, could produce 2,000,000 pounds of rubber annually, while the present output barely reaches 150,000 pounds. There is not a property today on the Purús which could not be worked to at least twice its present capacity, under skilful direction and management.

CLEARING AND WEEDING.

Special attention was paid in the course of the recent investigation to the question of clearing. According to the opinion of the commission, there is not much to choose between the forest growth in Brazil and that of the rubber-growing districts of the Orient. The average tree may be slightly larger in the Amazon Valley, but not to an extent to make any appreciable difference in the amount of labor required for felling and clearing up afterwards. Any differences in cost would be solely dependent on the wage rate and not on variations in natural physical conditions.

It has been asserted that with expensive labor, the cost of weeding on cultivated land in the Amazon Valley makes plantation work on Oriental lines a practical impossibility. The results of the investigation show that less labor is required for this purpose in the Amazon Valley than in the East. This fact is attributed to the absence of pernicious grasses, such as lallang; nor are the rapidly-seeding weeds common on eastern plantations nearly so numerous in Brazil.

METHODS OF TAPPING.

A separate chapter deals with the general question of the rubber industry of the Amazon Valley. Among many other points treated in this chapter is the subject of tapping. The view is expressed that under the present system of using the *machadinho* (or small axe), there is not only the risk of serious damage to the trees in the present, but the total extinction of the industry in the future is likewise inevitable. In order to demonstrate the advantages of the herring-bone system of tapping rubber trees by the use of the gouge, the members of the commission gave between 45 and 50 such lessons in the districts of the rivers Madeira, Purús, Tapájos and Xingú, and in the vicinity of Maués and Obidos. In this way they claim to have created an innovation in tapping methods, and firmly established the principles which have been carried to such successful issue in the Orient.

THE LABOR QUESTION IN THE AMAZON VALLEY.

The problem of the labor supply in the Amazon Valley is not easy of solution, but on it depends the future development and prosperity of this section of Brazil. In an interesting table it is shown that the annual exports of the Amazon Valley are estimated for 1913 at:

	Approximate quantity, tons.	Approximate value f. o. b. Manáos or Pará.
Rubber and caucho	48,000	$72,000,000
Brazil and Sapucaya nuts.....	12,000	750,000
Cacao	3,000	900,000
Hides and skins	1,500	175,000
Miscellaneous	6,500	475,000
Tons	71,000	$74,300,000

It is asserted that with a sufficiency of labor there is no reason why this production of some 70,000 tons annually should not be increased twenty-fold. The forests are extraordinarily rich in natural wealth, but generations must elapse before any expansion of the present bare nucleus of population can be sufficiently extensive to develop the vast resources left dormant so long. Immigration alone, it is added, can remedy the difficult conditions now dominating the situation.

It is pointed out by the report that two widely distinct classes of immigrants are required to make rapid development possible, and at the same time establish a permanent peasant population, hereafter to become an integral part of the Brazilian nation. These classes are on the one hand colonists or settlers, and on the other paid laborers. Both have spheres of action to fill, and both are urgently needed to people and open to civilization, those great tracts of land that Nature has endowed with such generous munificence.

Certain qualities are necessary in regard to the immigrants. They should be selected on account of a knowledge of agricultural work in their own homes, such as that possessed by the peasants in many districts of Italy, Spain and Portugal. These go in thousands to North America, Argentina and Southern Brazil; and they would come to the Amazon Valley, once its fertility and resources were made known to them, and good land became available for their occupation.

The other description of immigrant required is the paid laborer, to meet the needs of the owners of landed estates, from whose properties come the rubber, which forms quite fifteen-sixteenths of the total value of the exports from the Amazon Valley and is the source of the bulk of the revenues of the States of Pará and Amazonas. At present these rubber estates employ about 100,000 men, recruited from the more southern states of Brazil at an expense of about $100 each, to bring them to the districts of the Madeira, the Purús, the Juruá and other centers of rubber production. These men have not been paid direct wages, having worked on the sharing system, but a crisis in the situation has now been brought about by the competition of the Orient, and a complete change in the method of production has become an imperative necessity. To meet altered conditions, another 50,000 daily wage laborers are required within the next twelve months.

Hence the question arises as to where they are to be sought. It being useless to look for this number in Brazil, and there being a doubt of a ready response in Europe, the alternative is to bring the men from the East. The recruiting of Indian coolies not being permissible, the question is reduced to the advisability of introducing Chinamen.

From every point of view, the report urges, the employment of Chinese laborers indicates satisfactory prospective results in the Amazon Valley. They can earn high wages at a lower cost to the employer than is the case at the present time, the work being light and leaving ample leisure for the cultivation of a garden or a patch of food stuffs. Finally, they would not supplant the existing labor force, but would add to its efficiency in many directions. The carrying out of this plan would be a matter for the Federal Government, which could subsequently recover the

cost from the employers. It is estimated that the initial expenditure for bringing 50,000 Chinamen from Canton or Shanghai to the upper Amazon would not be less than the equivalent of $5,000,000, but this sum would not be an abnormal obligation, in view of the vastly important interests at stake.

COST OF PRODUCTION.

As shown in the May issue, the report of the Commission on the Orient makes the present free on board cost of producing rubber in the Malay Peninsula to be 14½d. (29 cents) per pound, while the estimate for 1914-1919 is 12d. (24 cents.) In comparison with these figures may be quoted the following estimate of Brazilian cost f. o. b.

	Pence.	Cents.
Freight to Manáos or Pará	½	1
Commission charges	½	1
Administration	3	6
Cost (per lb.) of maintenance of collector	....	..
Delivering 1,000 lbs. of rubber	16	32
Duties	12½	25
Total	32½	65

The present f. o. b. cost in the Orient is thus estimated at 29 cents with a prospective reduction to 24 cents, while the commission expresses the opinion that a similar position can be attained in the Amazon Valley within five years; by improved methods of tapping, largely increasing production without additional labor; by more systematic administration; by opening up the reserves of untouched trees; by cheapening the price of living; by diminution or abolition of the export duties, and by the introduction of Chinese or European immigration. By such means only is it possible for Brazil to meet successfully the competition of the Orient in the world's markets. In conclusion the report states that there is no doubt such reduced costs can be brought about, if the measures recommended are adopted.

GENERAL RECOMMENDATIONS.

The general recommendations of the commission are summarized in twelve brief paragraphs under the caption "Some Suggestions for the Improvement of the General Conditions of the Brazilian Rubber Industry." These suggestions are as follows:

In order to meet successfully the growing competition of the Orient in the rubber markets of the world, certain innovations and reforms are necessary. The objects in view are a reduction in the cost of production, an increase in the annual output, the preservation of the trees from unnecessary injury, the gradual development of a plantation industry, and the general prosperity of the owners of rubber properties and the laborers employed thereon.

I advance the following suggestions after careful considerations as the most practical means of dealing with the existing situation:

1. The distribution of illustrated literature printed in Portuguese throughout the rubber districts, explaining the system of tapping with the gouge and the injurious effects of the use of the machadinho.

2. The establishment of an Agricultural School at some central point, hereafter to be selected, where practical instruction will be given in methods of tapping, care of trees, system of cultivation, mode of treating latex, and preparation of rubber for shipment.

3. The erection of adequate machinery at Pará and Manáos for washing and preparing scrap rubber previous to shipment.

4. The appointment of expert rubber planters to make constant tours of inspection through the rubber districts in order to advise owners of properties in all matters connected with the cultivation, tapping and preparation of rubber.

5. To advise the Federal Government and the governments of Amazonas and Pará to grant a reduction of export duty to the extent of 75 per cent. on all shipments of rubber when the work of the extraction of latex has been carried out with approved implements and in the manner generally prevailing in the Orient. This concession to remain in force for not less than seven years.

6. To advise the governments concerned to enact a law prohibiting the use of the machadinho under penalty of fine or other punishment.

7. To urge the Federal Government to carry out the establishment of central hospitals throughout the rubber districts as provided for in the terms of Law No. 2543 of January, 1912, and the regulations decreed April 17, 1912, and for which funds have been voted.

8. To take the necessary steps to establish centers of supplies where the employers of labor can purchase at reasonable rates all articles required for the maintenance of workmen in the rubber districts, and in this manner bring about a substantial reduction in the cost of living.

9. To establish one or more experimental plantations in order to demonstrate economical methods for the production of rubber, cocoa and foodstuffs.

10. To take measures to encourage immigration from southern Europe and to consider carefully the question of the introduction of Chinese laborers.

11. To make arrangements to facilitate at low cost a supply of tapping tools, machinery for preparing rubber and agricultural implements.

12. To introduce the system of planting food crops in the alluvial deposits on the river banks after the annual floods.

I consider the last suggestion most important. The custom prevalent in Egypt for thousands of years of growing crops at low Nile could be imitated with extraordinary advantage in the Amazon Valley, especially on the upper rivers. The waters fall at the end of April and rise again in October, thus giving five months for the harvesting of maize, beans, rice, millet (dhura) and other foodstuffs.

Moreover, on the river banks between flood level and low water, no clearing of timber is required. The land practically needs no cultivation beyond dibbling the seed into the rich alluvial mud, and then nothing remains to be done except a little weeding until the harvest is garnered.

ENCOURAGEMENT OF NEW USES FOR RUBBER.

A PROPOSAL recently broached in the English financial press suggested that the rubber plantation companies, acting in unison, should set aside 10 per cent. of their crops to be held at the disposal of certain English and American manufacturers, at the fixed price of 2s. 6d. (60 cents) per pound, to be used solely for purposes not hitherto exploited. In commenting upon the subject, Mr. E. L. Killick, the rubber expert of the "Financier," expresses the opinion that the proposal makes a stronger appeal to reason the more deeply it is considered, no single argument of any weight having been brought forward in opposition to it.

He adds that any method of rendering more certain an adequate future demand should be welcomed and put into practice. Consequently the proposal named is regarded as worthy of close attention, coming, as it does, from one who has a large stake in the plantation industry and is thus evidently acting in perfect good faith.

The instability of raw rubber prices has been a most serious handicap to manufacturers, while it is more than probable that if there were any assurance of rubber remaining stationary in price, the large manufacturers would not hesitate to enlarge their works and plants. Mr. Killick expresses the conviction that if a basis of 60 cents were established, American manufacturers alone could take the whole of the world's supply.

If adopted, this proposal would, it is added, place at the disposal of manufacturers this year about 4,000 tons of plantation rubber at 60 cents. As it would be used solely for new purposes, there would be no question of unfair competition on the part of the selected manufacturers employing the "bounty rubber"; at the same time a step would be made in the direction of keeping consumption in line with supply.

Should be on every rubber man's desk—Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon; Rubber Trade Directory of the World.

The Obituary Record.

EDWARD BEECHER KELLEY.

EDWARD BEECHER KELLEY, treasurer of the Mechanical Fabric Co., Providence, Rhode Island, died at his residence in Brookline, Massachusetts, May 13, 1913, of pneumonia. He was sick only five days.

Mr. Kelley was born in Canton, New York, July 22, 1859, the son of Joseph H. and Samantha L. Westcott Kelley. He was educated at the public schools of Canton and later attended the Hungerford Collegiate Institute, Adams, New York, and the Peekskill Military Academy, Peekskill-on-the-Hudson. Immediately upon finishing school he began work in the office of the Stedman & Fuller Manufacturing Co., Lawrence, Massachusetts, and removed with that company to Providence in 1885. When the Mechanical Fabric Co. was organized in 1890 he went with his brother as one of the managers, and in 1899, upon the death of the late George A. Fuller, was elected treasurer and served in that capacity and also as director to the time of his death.

EDWARD BEECHER KELLEY.

He came from a long line of New England ancestry. His father's ancestor, John Kelley, settled in Newbury, Massachusetts, in 1636, and Stukeley Westcott, his mother's ancestor, came to Rhode Island with Roger Williams and received the first deed of land granted in that colony.

He had a wide acquaintance with the customers of the Mechanical Fabric Co. both here and abroad, the necessities of the business taking him frequently across the water. He was a man of a kindly, sociable nature, making friends quickly and holding them through life. He will be greatly missed not only by his immediate associates in business, but by a very wide circle of customers and friends. He was a member of the Rubber Club and rarely missed attending its gatherings.

He is survived by his wife, Maud A. Kelley, and his only brother, Arthur L. Kelley, president of the Mechanical Fabric Co.

GEORGE PELLINGER.

George Pellinger, president of the Vulcanized Rubber Co., 251 Fourth avenue, New York, with factory at Morrisville, Pennsylvania, died suddenly Saturday night, May 24. The funeral took place Tuesday, May 27, at his home in Weehawken, New Jersey. A sketch of his career, together with his photograph, will appear in our July issue.

ALANSON D. BROWN.

Alanson D. Brown, for many years the head of the Hamilton-Brown Shoe Co., St. Louis, Missouri, one of the largest distributors of rubber footwear in America, died on May 10, at San Antonio, Texas, where he went some time ago owing to a nervous breakdown. Mr. Brown was one of the best known men in the entire footwear trade. He was a man of the most extraordinary personal energy and powers of application. Undoubtedly it was this intense devotion to business that finally undermined his health.

He was born near Albany, New York, on March 21, 1847. He went West to seek his fortune before he had attained his majority. In 1872 he formed a partnership with James Hamilton under the firm name of Hamilton & Brown—which was later changed to the Hamilton-Brown Shoe Co.—for the purpose of establishing a wholesale footwear business in St. Louis. About ten years later the firm began the manufacture of footwear, and in a short time had secured an enormous business in this line.

Mr. Brown was married in 1877 to Miss Ella Bills, of Waltham, Massachusetts. His brother, George W. Brown, is the head of the Brown Shoe Co., of St. Louis—another large distributor of rubber footwear.

Mr. Brown devoted himself, almost without respite or relaxation, to his business—and to his church. He was a profoundly religious man—as much so on Mondays and the following five days as on Sundays. Business and religion with him were constantly interwoven. He was a man of the highest integrity and the finest sense of business honor.

JAMES WALKER.

News has been received of the death on May 8 of Mr. James Walker, the founder and chairman of James Walker & Co., Limited, of London. Mr. Walker was in his seventy-fourth year. He was well known in the rubber trade because of the variety of machinery and appliances used in that trade made in the "Lion Works," Garford street, London, which he founded many years ago. He was a man of sterling character and universally respected.

The organization of the house will not be changed by his death. The management of the company will be continued under the direction of Mr. George H. Cook.

MR. KLEINERT'S WILL.

The will of Isaac B. Kleinert, the founder of the I. B. Kleinert Rubber Co., who died April 18, has been probated. The value of the estate is given as more than $100,000 realty, and more than $100,000 personalty. Bequests are left to the United Hebrew Charities, and the Home for Aged Hebrews. His widow is left a cash legacy of $75,000, together with an annuity of $6,000, and a life interest in his realty holdings. The greater part of the remainder of the estate is divided between his two daughters and the children of a third daughter, now deceased.

One exceedingly interesting paragraph in the will, characteristic of the man, and of the interest he took in those in any way associated with him, is found in the following provision for his needy relatives: "I give and bequeath in trust to my daughters, Mrs. Leonie B. Guinzburg, of No. 115 West Eighty-sixth street, and Hermone E. Kleinert, of No. 31 West Eighty-seventh street, the sum of $10,000, the interest of which shall be distributed among poor and needy relatives of mine, this to continue for fifty years."

THE INCREASING POPULARITY OF RUBBER-SOLED SUMMER SHOES.

WHAT is deemed a rather remarkable feature in the shoe trade is the sudden increase in popularity of rubber-soled footwear. The so-called cemented tennis shoe, which has been a regular summer seller for years, has evidently made many friends, and the coming summer season will undoubtedly show more people shod in these canvas-upper, rubber-soled shoes, than any previous season. Every rubber shoe factory which makes

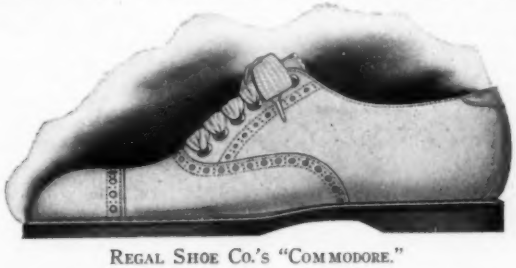
FOSTER RUBBER SOLES AND HEEL.

these shoes is today running to full ticket on these lines, and in some overtime work is necessary to insure deliveries when required.

But with the increased call for cemented tennis shoes comes the report that the old-time, cheap McKay-sewed canvas-upper tennis shoe has declined in popularity, and many shoe factories where these were turned out in large quantities, years ago, have discontinued their manufacture.

This decline in popularity is mainly ascribed to the lack of style, and the poor quality of the rubber used in the soles. So many shoes thus soled were returned to the manufacturers, on account of poor service, that they abandoned the production of these "sneakers," and very few are now being made.

However, in place of these, an entirely new phase of the shoe business is noted, namely the manufacture of fine shoes with rubber soles and heels. To be sure, such footwear has been made for years in sporting shoes, for the tennis court and the golf links, but the present development is the demand for summer footwear of finer qualities with rubber soles. Nearly every manufacturer of fine shoes, both men's and women's, is making



REGAL SHOE CO.'S "COMMODORE."

low-cuts with rubber soles and heels, and the shoe stores catering to the fine trade are all carrying one or several lines of such shoes.

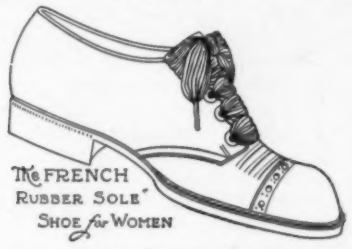
A former superintendent of a shoe factory in a western state is said to be responsible for the present popularity of rubber-soled shoes. Realizing that quality and service would result in bringing about a demand, he resigned his position in the shoe factory, and re-opened a rubber plant which had been forced to close because of the unsatisfactory quality of the rubber soles it turned out. It took him six years to restore the confidence of shoe manufacturers, but this was finally accomplished, and each succeeding year has shown a steady and large increase in the volume of business done. Other manufacturers have also succeeded in working up a large trade in rubber soles for shoes, and while

ONE OF THE ESSEX SHOES.

some are short-sighted, and make only low priced grades, of poor quality, by far the larger part of the sole now made are of excellent durability, well worthy the finer shoemaking of which they form a part.

Most of these shoes sold today are low cuts or Oxfords, and are in white or colored leather of dull or ooze finish. One of the principal uses for such shoes is for seaside resort wear, because of the obvious impermeability of the soles; and white or tan shades are most appropriate for wear with seaside costumes.

The fad—if such it may be called—came from England, where



MADE BY THE ESSEX RUBBER CO., TRENTON, N. J.

such shoes have been popular for several seasons, and many of the shoe stores selling to the finest trade have imported English shoes with rubber soles, though these are in no wise superior to American-made shoes of the same kind.

Manufacturers have found some difficulty in properly attaching the soles so as to insure against a separation of the rubber outer-sole from the leather welt, the inner-sole and the filler. A too fine stitch tends to split the rubber along the line of stitching, while silk and linen threads have been found to be less serviceable than long-staple cotton, treated with a special "wax" or

MADE BY THE ESSEX RUBBER CO., TRENTON, N. J.

cement, which so "fills" the interstices of the thread, and the holes made by the needle, that even when the threads wear off, the stitching still holds. This, with proper cementing, usually prevents peeling of the sole, which was one of the chief difficulties at first encountered. Some manufacturers double-stitch around the toe, and others insert metal clinch staples to prevent the start of such peeling.

Another form of overcoming the difficulty is the skiving off of the rubber sole at a point just in front of the ball of the foot, and piecing out the sole, from this line forward, with

leather. This has been done for several seasons in shoes intended for golf players, and having been found to work well, has been adopted in walking shoes, thus insuring the soft easy tread, yet protecting the most vulnerable point from undue wear or accident. In golf shoes this leather forepart is studded with hob-nails to secure footing while making the stroke, but of course these are omitted in walking shoes.

Some English shoes have the soles cemented on, and present to the eye a plain unbroken surface, but American manufacturers all prefer to supplement the cementing with stitching, and on the finer shoes the Goodyear machine stitch is used, though, as is mentioned above, the number of stitches to the inch is far fewer than in leather shoes.

These soles are of white, grey or red rubber, and various finishes—smooth, corrugated, checkered, or with deep holes, which tend to form vacuums when the wearer walks over a smooth wet surface, like the deck of a yacht. One rubber company manufactures a widely diversified line of these soles, varying in price from thirty cents to three dollars per pair. Some have the sole and a solid rubber heel of the same shape as common leather heels. Others have the heels separate, and some place two "lifts" of leather above the thinner rubber heel. Most of the shoes now made in these lines, however, have the "wedge" heels such as are shown in the illustrations.

Great care is taken in the choice of the inner-soles and linings of these shoes, to mitigate or overcome the tendency of rubber to "draw" the feet. Where these are properly chosen, the shoes can be worn with the same comfort and ease as leather shoes, with the added advantage of silent tread and freedom from slipping.

A tan Russia calf blucher Oxford for all-around summer wear has a sole of red rubber, stitched to a leather welt. This is a specially stylish and serviceable shoe.

The outing Oxford of white buck with russet trimmings, made on a narrow toe last, is a striking style, to be worn with outing costume or morning dress.

The shoes shown here are made by the fine shoe manufacturers in New England and retail at from $4.50 to $6.00. English made shoes, quite similar in style and quality, are shown in some of the finer retail shoe stores in New York, Philadelphia, Boston and Chicago at $6.00 to $10.00 a pair.

Many manufacturers number among their samples canvas shoes in white and brown, some reinforced with leather, while among women's shoes there are combinations and colors as varied as are customary with leather-soled outing shoes.

This development of the use of rubber soles is not an ephemeral fad. The style is likely to standardize itself, and the use is likely to grow with each recurring season, and thus more and more demand will be noted in the consumption of rubber, which is already very large, in the shoe industry.

RUBBER GOODS MANUFACTURING CO.'S FOURTEENTH ANNUAL REPORT.

ON May 21, 1913, the Rubber Goods Manufacturing Co. held its fourteenth annual meeting at the registered offices of the company in Jersey City. The president presented the following report:

REPORT OF PRESIDENT WILLIAMS.

TO THE STOCKHOLDERS OF THE RUBBER GOODS MANUFACTURING CO.:

The report of the treasurer, appended hereto, gives the Consolidated General Balance Sheet and the Consolidated Income Statement of the Rubber Goods Manufacturing Co. and of its subsidiary companies, for the fiscal year ending December 31, 1912.

The net sales of the year are approximately the same as those of the previous year. The net profits, however, are less, owing principally to the sharp competition in tires, which has prevailed during the year.

The plants of the company have been maintained in good repair and in certain instances enlarged—the Morgan & Wright plant at Detroit being in process of enlargement to more than double its former capacity.

The selling organization of tires, conducted by the United States Tire Co., has been further developed until now it has reached great efficiency.

Respectfully submitted,
ELISHA S. WILLIAMS, *President.*

TREASURER'S REPORT.

RUBBER GOODS MANUFACTURING CO. AND SUBSIDIARY COMPANIES.
Consolidated General Balance Sheet, December 31, 1912.

ASSETS.

Property, Plants and Investments...		$29,541,886.27
Inventories, Mf'd. Goods and Materials	$8,636,293.89	
Cash	2,407,332.36	
Bills and Accounts Receivable.....	12,634,719.90	23,678,346.15
Stock owned in General Rubber Co.	1,666,700.00	
Securities Owned.....	384,030.55	2,050,730.55
Sinking Fund Cash in hands of Trustee		382,759.61
Miscellaneous Assets		444,396.21
Total Assets		$56,098,118.79

LIABILITIES.

Capital Stock, Preferred.....	$10,351,400.00	
Capital Stock, Common.....	16,941,700.00	$27,293,100.00
Bonds of Mechanical Rubber Co. and N. Y. Belting & Packing Co.		1,005,500.00
Reserve for Redemption of Bonds..		423,348.87
Bills and Accounts Payable.....		8,354,395.10
Accounts Payable to General Rubber Co.		7,752,724.70
Reserve for accidents to employees.		40,940.47
Fixed Surplus (Subsidiary Companies)		2,499,218.65
Surplus		8,728,891.00
Total Liabilities		$56,098,118.79

Respectfully submitted,
EDWARD J. HATHORNE, *Treasurer.*

Of the above "Assets" and "Surplus" $197,126.13 represents the ratable interest therein of minority stockholders in a Subsidiary Company, of the Rubber Goods Manufacturing Co.

Contingent liabilities for certain guarantees, which are offset by corresponding contingent assets, are not included.

CONSOLIDATED SUMMARY OF INCOME AND PROFIT AND LOSS FOR YEAR ENDED DECEMBER 31, 1912.

Net Sales		$36,147,332.34
Earnings		2,885,883.27
Income from Investments.....		100,002.00
		$2,985,885.27
Less:		
Expenses of Home Office.....		221,396.78
Net Profits		$2,764,488.49
*Dividends	$2,280,601.00	
Reserve for Redemption of Bonds.	15,873.75	2,296,474.75
Surplus for the Period.....		$468,013.74
Surplus and Working Capital, January 1, 1912....		8,260,877.26
Surplus and Working Capital, December 31, 1912..		$8,728,891.00

Respectfully submitted,
EDWARD J. HATHORNE, *Treasurer.*

*Includes $31,250.00 paid minority interests in one Subsidiary Company.

ANNUAL ELECTION.

At the annual meeting, on May 21, the following directors were reëlected:

WALTER S. BALLOU	ERNEST HOPKINSON
ANTHONY N. BRADY	CHARLES A. HUNTER
SAMUEL P. COLT	LESTER LELAND
FRANK W. EDDY	RAYMOND B. PRICE
JAMES B. FORD	HOMER E. SAWYER

ELISHA S. WILLIAMS

The United States Rubber Co.'s Annual Report.

THE twenty-first annual report of the United States Rubber Co. was dated and distributed on May 1, three weeks ahead of the annual meeting, which occurred on May 20, at New Brunswick, New Jersey. The reports of the president and treasurer are given below.

REPORT OF PRESIDENT COLT.

TO THE STOCKHOLDERS OF THE UNITED STATES RUBBER CO.:

The past year has been somewhat eventful in the history of our company. Progress has been made along lines of efficiency in management with a proper expansion in operations, all having been kept within the sphere of sound and conservative business principles.

The report of the treasurer, appended hereto, gives the Consolidated General Balance Sheet and the Consolidated Income Statement of the United States Rubber Co. and subsidiary companies for the fiscal year ending March 31, 1913.

In view of the fact that the United States Rubber Co. now owns all but a fraction of one per cent. of the common stock and the great bulk of the preferred stock of the Rubber Goods Manufacturing Co., it has been thought that it would give our stockholders a more comprehensive understanding of our business to include this year in these consolidated statements the operations of the latter company. For the purpose of comparison, the statements of both companies as made last year should be considered. As now shown, the surplus includes the surplus of each company—that of the United States Rubber Co. of last year having been reduced by the common stock dividend, amounting to $5,000,000, and having been augmented by $2,254,700, gain by the conversion during the same period of second preferred stock into first preferred stock on the basis of four shares of second for three shares of first. In the Consolidated Statement the surplus is increased by $6,909,275, being the difference between the par value of the common stock of the Rubber Goods Manufacturing Co. purchased by the United States Rubber Co., and the price paid therefor; resulting, with the year's operations, in a present surplus of $23,545,629.32. From this surplus your directors have deemed it advisable to set up as a reserve $7,000,000.

The fixed surplus formerly appearing in the several statements of the two companies, which represented the surplus of each of their several subsidiary companies at the time of their acquisition, and which amounts to $14,504,714.54, not being subject to division, may be applied whenever deemed advisable in reduction of the valuation of property and plants.

The operations of the Canadian Consolidated Rubber Co., Ltd., the General Rubber Co., the United States Tire Co., and the Rubber Regenerating Co. (the latter recently acquired) are not included in the consolidated statements. The dividends, however, derived from the same go to make up the profits of the year.

CHANGE OF FISCAL YEAR AND OF DATE OF ANNUAL MEETING.

In view of the consolidation of accounts of the Rubber Goods Manufacturing Co. and its subsidiary companies with those of the United States Rubber Co. and its original subsidiaries, it became desirable that the fiscal year of both companies should be identical, and it has, therefore, been decided by the directors to have the fiscal year of the United States Rubber Co. end December 31, instead of March 31, to correspond with that of the Rubber Goods Manufacturing Co. and the Canadian Consolidated Rubber Co., Ltd., this being also the date when the reports have to be made up for the Federal Government. With this change in date of the fiscal year, it became desirable that the annual meeting should be held at an earlier date and an amendment to the by-laws has, therefore, been submitted to you, providing that the date of such meeting shall be the third Tuesday in March instead of the third Tuesday in May.

VOLUME OF BUSINESS.

As appears by the consolidated statement for the year, the net sales were $91,782,861.87; and in addition the net sales of the Canadian company for the year were $7,199,336.28. In most cases the selling prices were lower than the previous year. The sales of the General Rubber Co., United States Tire Co., and Rubber Regenerating Co. are not included, their product not adding to the aggregate product of manufactured goods.

PROFITS.

As shown by the consolidated statement, the net profits for the year were $7,544,217.67 after bringing down to market price the inventories of crude rubber and other materials. Of this profit, however, $219,131.31 pertains to the minority stock interest in the Rubber Goods Manufacturing Co. and a subsidiary. As heretofore all interest paid by the company upon both its funded and its floating debt is deducted as an expense before the net profit is shown. The net profits of the year exceed the dividend payments of the year by the sum of $1,730,755.36.

Both the net earnings and volume of business are the largest in the history of the company—the percentage of net profit on net sales being, however, but about 8 per cent.

DIVIDENDS.

The regular dividends of 8 per cent. upon the first preferred stock and 6 per cent. on the second preferred stock have been paid. There have also been paid to the holders of the common stock cash dividends at the rate of 4 per cent. for the first three-quarters and at the rate of 6 per cent. for the last quarter of the year, and also in July last a dividend of 20 per cent. in common stock.

CAPITALIZATION.

In June, 1912, by amendment to the charter, the authorized first preferred capital stock of the company was increased from $40,000,000 to $70,000,000, and the authorized common stock from $25,000,000 to $40,000,000, and the right was given to convert the second preferred stock into first preferred stock. Under the plan authorized $5,000,000 of common stock was declared from the surplus as a dividend to the common stockholders; $10,000,000 of first preferred stock was offered pro rata to the stockholders at par, of which $9,699,400 has been subscribed and paid for; and up to this time, $9,018,800 out of $10,000,000 of second preferred stock has been converted into first preferred stock. The company also renewed a former offer to exchange Rubber Goods preferred stock into first preferred stock of the United States Rubber Co., under which offer $817,800 has been exchanged during the year.

TIRE OPERATIONS.

At the last annual meeting your president called the attention of the stockholders to the desirability of enlarging our facilities for the making of tires, and suggested the building of an additional mill. In furtherance of this suggestion, the Morgan & Wright tire plant at Detroit, Michigan, which is a modern mill, is being enlarged to more than double its former capacity; and a new tire mill at Berlin, Canada, is about completed.

Our sales of tires for the first three months of this calendar year show an increase of about 40 per cent. over those of the corresponding months of last year.

ACQUISITION OF THE RUBBER REGENERATING COMPANY.

Next perhaps in importance to obtaining advantageously supplies of crude rubber is the obtaining of the regenerated product of the proper quality in order to derive the best results in manufacture. Though laboratory work in the proper compounding of rubber in this country is practically in its infancy, Mr. Raymond B. Price, president of the Rubber Regenerating Co., and his staff of chemists have demonstrated their marked ability in this line. Your board has no doubt that not only will the direct earnings of the Rubber Regenerating Co. fully demonstrate the wisdom of its purchase by our company at the price of $6,000,000 in our common stock, but that the indirect advantages to the United States Rubber Co. will far surpass even the direct returns.

CRUDE RUBBER—FAR EASTERN PLANTATIONS.

During the past fiscal year crude rubber has had a downward tendency, the extreme prices for fine Pará being $1.23 on August 22, 1912, and $0.90 on March 31, 1913.

The development of our plantations in Sumatra has continued during the year. We now have planted with *Hevea* rubber trees (fine Pará) 32,500 acres, or an area more than double that of Manhattan Island, comprising 3,900,000 trees. The growth of the trees has been more rapid than anticipated, so that we look for the first rubber from our own estates next autumn, a year earlier than expected. It would seem inevitable that our company must realize great benefit when the time arrives that we will obtain at least a large portion of our requirements of crude at its cost of production in Sumatra.

PROFIT SHARING.

The profit sharing plan, as adopted last year, met with much favor among our employes. It was taken advantage of very generally, and an earnest desire is shown to anticipate payments for the stock subscribed for. Your directors have de-

cided to make a similar offering this year, the price fixed for the stock, however, being $65, instead of $45, at which price with increased dividend the yield will be as great.

OUR OFFICE BUILDING.

Our new twenty story office building, corner of Broadway and Fifty-eighth street, New York city, was completed last summer. In point of location, beauty of architecture, utility of layout and thoroughness of construction, it is a most gratifying success. Our company itself occupies at present ten floors, as well as the basement and sub-basement, and all of this space is fully and economically utilized. Nearly all of the remaining space has been rented to good tenants and we expect that the unoccupied residue will also be let before the end of the present renting season. It is further believed that as the years roll around higher rents will prevail in our locality, thus making our investment increasingly profitable.

MAINTENANCE OF PROPERTIES AND RESERVE.

It has not been the custom of our company to make specific charges for general depreciation of properties, but on the other hand our many plants, here and in Canada, are maintained in the highest degree of efficiency, all repairs and replacements being charged to expense account. The setting up out of surplus of a reserve available for depreciation of $7,000,000, will, it is believed, commend itself to our stockholders, especially when taken in connection with the fact that the fixed surplus of $14,504,714.54 may be similarly applied when deemed advisable.

CONCLUSION.

Your president desires to express his appreciation of the ability and fidelity shown during the past year by the officers, heads of departments and employes of the company. The importance of this spirit cannot be overestimated, as it is only by the loyal co-operation of all connected with the company that the best results can be obtained.

It is with deep regret that we record the death of Mr. Edward R. Rice, who was an able and faithful officer of the company for many years and who was a member of the board of directors, and also held the responsible position of manager of sales at the time of his death.

The present condition of the business of the company is very satisfactory and the outlook for the future is most promising. Our sales of merchandise have substantially increased the past year over any previous year. The lower prices prevailing for crude rubber and the certainty of an ample supply of the crude product of the best quality from the cultivated plantations of the far east would indicate a future expansion of the rubber manufacturing industry to a far greater extent than would have been possible if the source of supply of the crude article had continued limited, as in past years, to the wild growth of the rubber tree in the forests of Brazil and elsewhere.

Confidence in the unselfish patriotism of our government creates the conviction that whatever shall be finally done by it with respect to the tariff or otherwise will be done for the welfare and prosperity of the whole people. Towards this prosperity your company must contribute a helpful part and of its benefits will have the full share that it will deserve. Respectfully submitted.

SAMUEL P. COLT, President.

TREASURER'S REPORT.

UNITED STATES RUBBER COMPANY AND SUBSIDIARY COMPANIES.

(Not including assets or liabilities of General Rubber Company, Canadian Consolidated Rubber Company, Limited, United States Tire Company and Rubber Regenerating Company.)

ASSETS.

Property and plant (including shares of Canadian Consolidated Rubber Co., Ltd., and Rubber Regenerating Co.)		$105,687,667.88
Inventories, manufactured goods and material	$30,384,520.03	
Cash	7,456,804.28	
Bills and loans receivable	1,281,808.97	
Accounts receivable	28,292,273.11	
Stock owned in General Rubber Co.	5,000,000.00	
Securities, including stock and bonds of U. S. Rubber Co. held by subsidiary companies	6,439,680.55	
Sinking fund cash in hands of trustees	382,759.61	
Miscellaneous assets	845,313.09	80,083,159.64
Total assets		$185,770,827.52

LIABILITIES.

Capital stock, first preferred	$57,281,300.00	
Capital stock, second preferred	981,200.00	
Capital stock, common	36,000,000.00	94,262,500.00
Minority Rubber Goods Mfg. Co., preferred stock	1,596,100.00	
Minority Rubber Goods Mfg. Co., common stock	60,000.00	
Minority stock subsidiary of Rubber Goods Mfg. Co.	37,500.00	1,693,600.00
Ten-year 6 per cent. collateral trust sinking fund gold bonds		18,000,000.00
Bonds of subsidiary companies		1,975,500.00
Loans and notes payable	17,750,696.03	
Merchandise Accounts Payable	2,840,191.02	
Accrued interest, taxes, etc	759,054.50	21,349,941.55
Due General Rubber Co.		8,125,141.76
Reserve for dividends		1,700,344.00
Reserve for redemption of bonds		423,348.87
Reserve for depreciation		7,000,000.00
Fixed surpluses (subsidiary companies)		14,504,714.54
Surplus		*16,735,736.80
Total liabilities		$185,770,827.52

The contingent liabilities for certain guarantees, which are offset by corresponding contingent assets, are not included.

$2,000,000 of the original issue of $20,000,000 bonds have been canceled under Sinking Fund provision.

Those Companies whose fiscal year ends on December 21 are for the year so ended.

*Of this surplus $190,107.48 pertains to minority stock interests.

CONSOLIDATED INCOME STATEMENT FOR YEAR ENDING MARCH 31, 1913.

Net sales, footwear, tires, mechanical, misc.		$91,782,861.87
DEDUCT:		
Cost of manufacture, selling, general expenses and taxes		81,307,154.90
Operating profits		$10,475,706.97
Other income (net)		84,123.49
Total income		$10,559,830.46
LESS:		
Interest on funded and floating debt	$2,170,598.63	
Interest allowed customers for prepayment	736,459.35	2,907,057.98
Net income		$7,652,772.48
Deductions for bad debts		108,554.81
NET PROFITS		$7,544,217.67
Dividends—U. S. R. Co.	$5,594,332.00	
Dividends to minority R. G. M. Co. and Susidiary Co.	205,623.00	5,799,955.00
Surplus for period		*$1,744,262.67
Additions to surplus—adjustment R. G. Mfg. common stock from cost to par value	$6,909,275.00	
Capital gain in conversion of second preferred into first preferred stock	2,254,700.00	
Transferred from reserves to surplus	390,891.98	9,554,866.98
		$11,299,129.65
Surplus U. S. R. Co., April 1, 1912, and R. G. Mfg. Co., January 1, 1912		17,436,607.15
		$28,735,736.80
Common stock dividend		5,000,000.00
		$23,735,736.80
Deductions from surplus—reserve for depreciation		7,000,000.00
Surplus March 31, 1913		$16,735,736.80

Respectfully submited,

JAMES B. FORD, *Treasurer.*

*Of this surplus $13,507.31 pertains to minority stock interests.

BUSINESS OF THE COMPANY.

The following table showing the amount of net profits of the United States Rubber Co. and the amounts disbursed in dividends since the organization of the company, has been compiled from the printed reports of the successive treasurers of the corporation:

YEAR ENDING—	Net Profits.	Dividends.
March 31, 1893	[Not Published.]	
March 31, 1894		
March 31, 1895	$2,716,370.00	$2,056,190.00
March 31, 1896	2,339,790.60	2,056,190.00
March 31, 1897	1,999,611.34	1,552,040.00
March 31, 1898	2,070,750.41	1,164,030.00
March 31, 1899	3,226,513.46	1,882,040.00
March 31, 1900	3,007,887.54	2,828,680.00
March 31, 1901	62,605.57	705,765.00
March 31, 1902	deficit	none
March 31, 1903	1,594,908.16	none
March 31, 1904	1,575,641.29	none
March 31, 1905	3,761,922.63	1,882,040.00
March 31, 1906	3,881,270.23	2,846,092.00
March 31, 1907	4,590,382.72	3,485,956.00
March 31, 1908	3,553,556.14	3,495,448.00
March 31, 1909	4,507,655.39	3,498,940.00
March 31, 1910	5,535,163.15	3,574,205.00
March 31, 1911	4,349,825.73	3,800,000.00
March 31, 1912	5,376,306.86	4,550,000.00
March 31, 1913	7,544,217.67	5,799,955.00 *5,000,000.00

*Common stock dividend.

THE ANNUAL ELECTION.

At the annual meeting, on May 20, the entire board of directors was reëlected. All of these directors have served for some time with the exception of Mr. Price, who was elected in February last, in place of Mr. E. R. Rice, deceased. They are as follows:

1. WALTER S. BALLOU, Providence, Rhode Island.
2. E. C. BENEDICT, Greenwich, Connecticut.
3. ANTHONY N. BRADY, Albany, New York.
4. SAMUEL P. COLT, Providence, Rhode Island.
5. HARRY E. CONVERSE, Boston, Massachusetts.
6. JAMES DESHLER, New Brunswick, New Jersey.
7. JAMES B. FORD, New York City.
8. J. HOWARD FORD, New York City.
9. FRANK S. HASTINGS, New York City.
10. FRANCIS L. HINE, New York City.
11. HENRY L. HOTCHKISS, New Haven, Connecticut.
12. ARTHUR L. KELLEY, Providence, Rhode Island.
13. LESTER LELAND, Boston, Massachusetts.
14. D. LORNE MCGIBBON, Montreal, Canada.
15. RAYMOND B. PRICE, New York City.
16. HOMER E. SAWYER, New York City.
17. FREDERICK M. SHEPARD, East Orange, New Jersey.
18. WILLIAM H. TRUESDALE, Greenwich, Connecticut.
19. THEODORE N. VAIL, Boston, Massachusetts.
20. JOHN D. VERMEULE, New York City.
21. ELISHA S. WILLIAMS, Nahant, Massachusetts.

OFFICERS OF THE UNITED STATES RUBBER CO.

At a meeting of the Board of Directors of the United States Rubber Co. for organization, held at the office of the company, 1790 Broadway, New York, May 23, 1913, the following officers were duly elected for the ensuing year: Samuel P. Colt, president; James B. Ford, vice-president; Lester Leland, second vice-president; W. G. Parsons, treasurer; E. J. Hathorne, assistant treasurer; Samuel Norris, secretary; John D. Carberry, assistant secretary; Homer E. Sawyer, general manager footwear business both manufacturing and selling; Elisha S. Williams, general manager tire, mechanical and miscellaneous business, both manufacturing and selling; and Raymond B. Price, general manager development department.

EXECUTIVE COMMITTEE.

Samuel P. Colt, James B. Ford, Lester Leland, Walter S. Ballou, Anthony N. Brady, Elisha S. Williams, Homer E. Sawyer.

THE RUBBER TRADE IN BOSTON.

By a Resident Correspondent.

REPORTS differ as to business conditions, and manufacturers making similar lines are not entirely agreed regarding the state of trade. A review of the leaders here in the rubber industry, however, seems to show that while there is a moderately active business the orders appear to be conservatively small, seeming to indicate the policy on the part of customers to be safe rather than sorry. In clothing there is a good business doing in the finer qualities, while in the cheaper grades trade is far less active. In druggists' goods a rather lively demand is noted, many of the chain drug stores as well as the department stores doing extensive advertising and reaping the benefit of their publicity. The boot and shoe business is very far from satisfactory. The natural disposition has been to hang back and to delay ordering as long as possible without losing the benefit of the extra five per cent. for early orders. The rubber companies offered this extra discount on all orders coming into their hands prior to July 1, and on May 15 they notified their customers that this time limit would be extended—with the result that many customers are likely to procrastinate still further. The one really satisfactory branch of the rubber manufacturing business is tires, the demand for which is sufficient to keep every factory working over-time.

* * *

Speaking of the tire business reminds your correspondent that in front of the main office of the Tyer Rubber Co., at Andover, is a sign "Tires pumped here free." As this factory is on a main, traveled road, where thousands of automobiles pass, the sign brings many machines to a stand-still, and right there, outside the doorway, is a case containing a handsome, snow-white Tyrian Tire, conspicuously labeled. This case is strongly illuminated at night, and not only becomes a standing advertisement for these tires, but is also a prominent land-mark from which to compute distances and identify location.

* * *

Jenkins Brothers, manufacturers of the "Jenarco" sheet jointing and packing, are finding that their newly fitted up store and warehouse at 524 Atlantic avenue is none too large for the added business which has come to them since their removal to that address a few months ago. Manager Stiles wears a smiling face these days and presents to his customers a series of illustrated blotters, bearing the Jenarco trade-mark, and pictures of youthful base-ballists which bring back memories of boyhood days.

* * *

The Walpole Tire and Rubber Co. are removing their offices, which have for some years been in the Brown Building, corner of Sumner street and Atlantic avenue, where they occupied the entire fifth floor. The business headquarters will be located at the store opened a few months ago at 757 Boylston street, right in the heart of the automobile supply trade, and therefore especially beneficial to their tire business. The shoe supply department, however, will still be located in the shoe district, in the vicinity of Sumner and Lincoln streets.

* * *

J. W. Fenner, formerly with the W. Brigham Co., Cleveland, spent a portion of his pleasure trip east in this city last month, and while here called on many of his friends in the trade.

* * *

Hon. L. D. Apsley, president of the Apsley Rubber Co., with Mrs. Apsley, sailed on the *Canopic* from this port April 26, for a tour of Europe. Reports of their safe arrival and thorough enjoyment of their vacation have been received.

* * *

Charles A. Coe, eastern selling agent of the United States Rubber Co., has moved his family to Annisquam, where he has

a summer residence and a motor boat, both of which he thoroughly enjoys throughout the summer and early fall months.

* * *

Captain Francis H. Appleton (every rubber man in the country knows him) completes his year as commander of the Ancient and Honorable Artillery Company this month. On the first Monday in June he will march, at the head of this distinguished military company, to the Old South Church, thence to the world-renowned Boston Common, where, after a drum-head election, he will surrender his insignia of office to the Governor of Massachusetts, who will confer it upon his successor. But his duties will not yet be done, for there will be a monster banquet at Boston's newest hotel, where he will preside, in the evening. This will be an unusually brilliant function, for this year rounds out two and three-quarters centuries in the history of the company, and due cognizance will be taken of this event. Captain Appleton's year in command has been a notable one, and he retires with honors heaped upon him by his fellow officers and the rank and file of the organization.

* * *

George E. B. Putnam, editor of the rubber department of the "Boot and Shoe Recorder" of this city, sailed from New York on a vacation voyage to Panama and neighboring Central American and South American ports, and will be gone several weeks. During a service of nearly a quarter of a century this is the first time he has absented himself from duty for a longer period than two weeks. Mrs. Putnam accompanies him.

THE RUBBER TRADE IN AKRON.

By a Resident Correspondent.

ONE is reminded of the recent strike that lasted for a number of weeks in Akron by the letter which has recently been sent by Mr. E. C. Shaw, second vice-president of the B. F. Goodrich Co., to Mayor Rockwell of Akron, in which he encloses a check of $2,000 to be applied to the Police Pension Fund. In his letter Mr. Shaw writes as follows:

"Generally speaking, to no class of workers is less appreciation shown for fidelity and integrity in the performance of duty than to our public officers and servants. It is, therefore, with great pleasure that we, along with all other law-abiding and order-loving citizens, hereby express our approval of the manner in which the police department of our city, under the guidance and direction of yourself and the chief of police, and the sheriff of our county and his assistants, so ably protected life and property, preserved order and enforced obedience to law during the recent attempt on the part of certain irresponsible individuals to demoralize the usual good behavior of some of our citizens.

"We are enclosing a check, payable to the trustees of the police fund, as a slight token of our appreciation for the services rendered, not so much to ourselves as to the city generally. In so doing, we have no apology to offer to the breeders of discontent or to the preachers of anarchy, all of whom we are sure will have no hesitancy in criticising the police department for its conduct and our action in commending it."

The Mayor in his reply wrote: "I heartily agree with you that our police force deserves the hearty commendation of every law-abiding and order-loving citizen for the courageous and impartial manner in which the situation was managed, and thank you for the substantial manner in which you manifest your appreciation of their conduct."

* * *

The Akron rubber factories are running full force and are working day and night and need more help than they can secure. It is claimed that there is need of 5,000 workingmen in Akron at the present time.

* * *

Mr. E. C. Shaw, second vice-president of The B. F. Goodrich Co., is making a trip to Paris to inspect the Goodrich plant at that place. This plant is having marvelous success and although established in a foreign country and in the seat of the foreign tire business, has made great progress. It is manufacturing a full line of auto and truck tires and is pushing work in the line of mechanical goods manufactured by the factory in Akron. It is the first and only complete American plant in a European country. The foreign sales organization of the Goodrich company is now complete and radiates chiefly from London. A large number of the tires for this foreign trade are supplied by the Paris plant.

The B. F. Goodrich Co. has combined the old Diamond sales office and the service station with the Goodrich sales office and service station in Pittsburgh, and is moving into a large new building at 414 Craig street, erected for the Pittsburgh trade.

The Goodrich company's combined newspaper, magazine and outdoor advertising for a period of six months, if carried on one bulletin board, more than a mile high, would reach over ten miles, or from one end of Manhattan Island to the other. The lamps of their electric signs would illuminate the streets of a large city, while their road markers would cover over 30,000 miles of road.

* * *

Mr. Anthon Berg, a noted expert on balata belting and packing, has just completed the installation of the balata belting and asbestos sheet packing plant of The Goodyear Tire & Rubber Co., of Akron. Mr. Berg has installed several large balata belting plants in Europe and has spent more than a score of years in the balata belting business. He expects soon to return to Sweden, his native country, where he will spend the summer, returning in the fall to the United States.

* * *

On account of their increased trade, the Firestone Tire & Rubber Co. has been compelled to build a new service station for solid tires at West End avenue and Sixty-second street, New York City, which will be opened about July 1. It is of concrete fireproof construction, four stories and basement, and is built so that additional stories can be added as needed. The building will cover between 30,000 and 40,000 square feet. It is aimed to make this station complete in every respect, with facilities for the repair of 50 trucks at a time. It has a complete steel and woodworking shop, so that all parts of the wheel can be furnished immediately. In addition, this building will be used as a distributing point for New York and vicinity for all rim and solid tire equipment. The plant will be open 24 hours a day and seven days a week. No expense has been spared to make this a time saving service station. It is the plan of the Firestone company to connect a similar service station directly with its tire branches in all the larger cities. A year ago similar, though smaller service stations were built in Boston and Philadelphia.

The Firestone factory is running day and night, on account of the immense growth of business.

The rim plant of the Firestone company has shown a wonderful growth and is running day and night. During the past eighteen months the business has increased 600 per cent. It is claimed that more than half the new cars put out this year are equipped with Firestone rims.

The Firestone Tire & Rubber Co. has opened a new branch in Syracuse, N. Y., under the management of E. A. Huffman, at 502-504 East Genesee street.

A RUBBER COMPANY HELPING CIVIC WORK.

ON May 13 an entertainment, with an accompanying exhibition, was held in the assembly hall of the Hood Rubber Co. plant at Watertown, Massachusetts, under the auspices of the North America Civic League of that town. The exhibition showed the character of the work done at the League settlement house, and the entertainment consisted of music, dramatic selections and a stereopticon lecture.

THE RUBBER TRADE IN CINCINNATI.

By a Resident Correspondent.

THERE has been no lack of demand for all lines in the rubber trade locally. In fact the activity has been such that the local houses are scarcely able to cope with the situation. This is particularly true of the tire business. This branch of the trade has just recovered from the demand for tires resulting from losses in the recent flood in the Ohio Valley, and the local branch houses have about completed the re-stocking process to meet the demands occasioned by favorable spring weather, when they are confronted with the present street car strike. The automobile and motor truck have come to the rescue. Every kind of vehicle has been pressed into service to help out the situation. Vehicles that have been tireless all winter, and some that have been stored away for several seasons, are being used to transport a portion of Cincinnati's 400,000 inhabitants from their homes to their work and business places. In consequence the rubber tire people are at this time the busiest persons in the city, supplying the demands. There is also a good demand for rubber footwear for immediate shipment, most of the orders coming from the recent flood district and representing complete stocks.

* * *

It was cheerful news to automobile tire manufacturers that was sent out from Columbus by the Register of Automobiles when it was announced that Ohio's automobile record for 1912 had already been passed. With license tags issued to May 10 the total reached 63,720, compared with 63,117 for the entire year of 1912. It is predicted that the year's business will reach 85,000.

* * *

The Lee Tire and Rubber Co. has opened a branch house at Eighth and Main streets. The new branch is in charge of E. M. Henderson as manager. The company carries a large stock of tires and other rubber automobile accessories.

* * *

If the present street car strike continues for any length of time Cincinnati will be the silent city. Since walking has become the habit in this city there has been a great demand for rubber heels, and cobblers together with shoe dealers have been obliged to employ extra forces to tack on rubber heels and rubber soles. It is estimated that the first two days the strike was in progress over 5,000 pairs of rubber heels were sold; and the rubber heel business has come to stay locally, as the strike has been a pronounced educator as to the value of rubber heels and soles. It goes without saying that dealers are making every day of the strike count.

* * *

H. Bumiller and M. E. Remelin, of the firm of Bumiller & Remelin, local agents for the Seamless tire and dealers in rubber automobile and motorcycle accessories, were the hosts of about 100 motorcycle owners at a recent chicken dinner in the country. This firm has done much to bring the motorcycle into general use in this city and it constantly entertains riders in one fashion or another.

* * *

The Ohio Rubber Co., operating houses in Cleveland and Cincinnati, and dealing in rubber clothing, footwear, belting and rubber sundries is about to branch out in the wholesale line on an extensive scale. This company now occupies a seven-story building at 612-614 Race street, where it has been located for about 20 years, conducting a retail business principally. The company has just entered into a lease for a new seven-story concrete building which is nearing completion at 228-230 West Seventh street. The company announces that the tremendous growth of its wholesale business prompts it to devote its entire attention to this department. It is the intention of the company, as soon as the new quarters are completed, to close out its retail department which is one of the largest and most complete in the state of Ohio. The company's business in this city is in charge of Howard J. Howard, who is general manager of the firm.

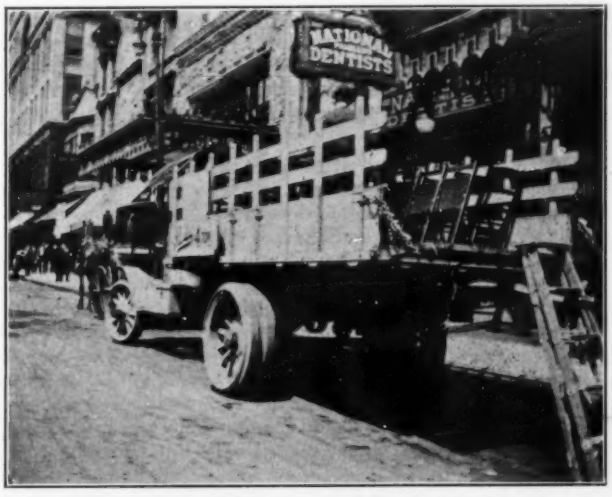
* * *

A meeting of the Executive Council of the Ohio State Pharmaceutical Association has been called for the purpose of outlining plans to have the postal laws applying to the trade more clearly defined. Because of the reading of the law druggists are afraid to send certain of their wares through the mails. It is the purpose of the meeting to prepare a list and present it to Congress.

THE RUBBER TRADE AND THE CAR STRIKES.

WHILE in Cincinnati and adjacent territory recently the population, as a whole, has been groaning beneath the imposition of a street car strike because of which for over a week not a car ran in this "City of Distances," the dealers in automobile supplies, and particularly in tires, found much to their liking.

To begin with, everyone who had a car used it to the utmost. Cars were employed to get the household help and to take them home; cars were sent to the grocery, where the grocer had none of his own or found his wagon service insufficient. The family automobile was used by the head of the household for business purposes to round up his own employes and to help in delivering goods; all of which used up tires and sent the owners of the cars to purchase more, materially assisting the work of tire consumption. Obstructions placed in dark nooks of the streets by



TEMPORIZED PASSENGER SERVICE DURING CAR STRIKE.

street car sympathizers, slivers from boards, sharp bits of rock, nails and tacks placed where they would be effective, helped the tire business greatly. Of course the auto tire and repair concerns got a share of the extra profits, receiving from a quarter to seventy-five cents a puncture per tube, and from three to seven dollars for fixing a casing; but generally tires would be so badly damaged as to require a new supply.

Again, while forty-six hundred automobiles are registered in and about Cincinnati, the strike caused many a non-motorist to invest in a second-hand car. From this he will get the habit, later buy a new car, and so increase the demand for tires.

It is not to be wondered at, therefore, if the automobile dealers and the sellers and repairers of rubber tires are able to view a car strike with a very moderate amount of distress.

The accompanying photograph shows how passenger service in Cincinnati was taken care of during the car strike. It shows a four-ton truck in which chairs have been arranged along the sides, reached by a step ladder from the back.

THE RUBBER TRADE IN CHICAGO.

By a Resident Correspondent.

THE most noteworthy feature in the rubber trade is the activity noted in the mechanical line. Almost every dealer in the Chicago market reports business in this particular branch of the trade as active. Many of them say they are working their factories night and day in the effort to keep up with their orders. Another line that has been fairly active is rubber clothing, but it has been a poor season for rubber shoes. Garden hose has had a good season, far better than last year, which was a wet year; and many people put off buying garden hose until it got so late that they concluded to do without. The tire business has also been good, and all houses report an increase in sales.

* * *

The Salisbury Co. held its annual meeting recently. All of the old officers were re-elected. The annual report showed one of the best years that concern has had. Its wholesale business showed an increase of more than 56 per cent. over that of a year ago. This remarkable increase was attributed to a large contract received from the Rumely Co. for a special patented belt.

* * *

E. F. Lindley, of the Raven Mining Co., is spending a good deal of time on the road. After returning from a trip of inspection of the company's mines he left for an eastern trip, from which he has just returned.

* * *

William E. Barker, manager of sales of the United States Rubber Co., visited the local offices of the company about the middle of May. R. F. Spencer, comptroller of that corporation, visited the local offices during the first part of May.

* * *

Dealers in local rubber circles are greatly incensed by the increasing number of "fly-by-night" rubber coat concerns which are springing up over the "loop" district and which have done a great deal of injury to the legitimate rubber coat business.

These unsavory companies generally use old-established and well-known rubber names, in order to mislead the people, who, naturally, seeing a familiar name on the store front and in the advertising, assume that the store is connected with the well-known company bearing that name—or, bearing one so similar that the ordinary purchaser would not notice the difference. It is stated that both the Goodrich and the Goodyear companies have brought court proceedings against these people, but have so far been unable to get any redress.

Another feature of the situation that makes it possible for these illegitimate concerns to thrive is the fact that the papers of large circulation seem to be willing to accept their advertisements.

The way these concerns operate is what hurts the legitimate trade. They rent a store in close proximity to a legitimate house, usually on a short-time lease—say, a month or two, or sometimes longer. They then load up their show windows with good-looking coats and advertise ridiculously low prices for their goods. Of course the nature of the show attracts attention, and once a prospective buyer is in the place the salesmen almost lock the store rather than that he should get away. Indeed, a very small percentage of them ever get away without making a purchase. Of course after the coat is worn through one good rain the purchaser discovers that it leaks like a sieve, and some of the cheaper kinds all but fall apart. By the time redress is sought the firm has moved away, and frequently the buyer goes into the legitimate concern close by and raises trouble, and it is with difficulty that he is convinced that he did not buy the coat in the latter place.

An incident which recently occurred serves to illustrate their operations. A man who was a close personal friend of an official in one of the large local rubber concerns received a present of a coat bought in one of these will-o'-the-wisp stores. His wife was going to treat him to a mild surprise and purchased the coat as a birthday present. The gentleman in question went to his friend and asked him what he thought of the coat. After closely examining it the rubber dealer stated that his house sold the same coat for $5. The owner then stated that his wife had paid $12 for it. He found where the coat was purchased, went to the store and tried to recover his money, but naturally did not succeed.

How to get rid of these pests and save the legitimate dealer from injury is a problem which remains to be solved. Local dealers would welcome any plan which would curtail, or better still, eliminate, these objectionable concerns.

A law similar to that put in operation in Minnesota recently would be one way in which some relief could be obtained. This law prohibits any firm from misrepresenting its goods in any advertisement. If the local rubber dealers would get together and petition their legislators to secure legislation of this sort it would tend to minimize this evil.

THE RUBBER TRADE IN RHODE ISLAND.

By a Resident Correspondent.

A LARGE new addition to the administration building is being constructed at the plant of the Revere Rubber Co. on Valley street, Providence, that will be up-to-date in every particular. A refrigerator system is being installed which will complete the cooling system for the warehouses where the product of the plant is stored. A large force of workmen is engaged in completing the battery of new boilers which are being installed. The entire establishment is being operated day and night, ten hours to each shift, and the management reports that it is finding great difficulty in caring for its constantly increasing orders.

The demand for solid tires for motor trucks continues to increase with great rapidity, so much so that the capacity of the plant is unable to keep pace with the demands made upon it. The orders on the company's books for solid tires are reported as being very much ahead of the number for pneumatics, due to the sudden big demond for motor trucks for delivery and heavy work.

* * *

The wire drawing department at the factory of the National India Rubber Co. at Bristol is to be enlarged, because of the increased business. A room 40 by 60 feet, east of the present wire drawing room, is to be equipped with several of the finer wire drawing machines. A new roof has been put on the building and concrete floors are being laid, so that when completed it will present a very modern appearance. A new smoke-stack is also being installed.

* * *

Would-be thieves entered the plant of the Air Lock Rubber Co., 42 Thurston street, Pawtucket, a few days ago, but were evidently frightened away before they could steal anything, as nothing was missed from the premises. A pedestrian passing the plant heard noises inside that attracted his attention and he notified the police. It was found that a side window had been entered, but no one was found in the building.

* * *

The Atlantic National Bank, of which A. T. Baldwin, of the Walpole Rubber Co., is a director, and which was recently closed by order of the Comptroller of the Currency, is declared, in the report of Bank Examiner Schofield, to be insolvent, and Receiver Curtis has been instructed to liquidate as soon as possible.

Percy W. Gardiner, who was one of the committee of investigation into the affajrs of the Consumers' Rubber Co. in January, 1912, is president of the Atlantic National.

An excellent photographic picture of the Banigan Rubber Co.'s factory at Woonsocket appears in the back of that concern's new catalogue, recently issued.

* * *

LeBaron C. Colt, manager of the National India Rubber Co., at Bristol, has been elected captain of the new honorary veteran military organization in that town.

* * *

Just at this time, when innumerable schools and colleges throughout the country are preparing to send forth their annual quota of young men into the business and professional world to carve out a future, it is very interesting and instructive to hear from men who are at the head of large business enterprises or commercial establishments some of their personal experiences in attaining these high standings.

Not many young men fitting themselves for teaching would think of giving up that vocation and taking to another calling, much less in the humbler position of errand boy. Isaac Crocker, of the Hope Rubber Co., did this when he was 21 years of age. He is now president and treasurer of a system embracing ten rubber companies.

"Leaving my school work," said Mr. Crocker recently, "I went to Lowell, Mass., where I let myself out at $4 a week as an errand boy. It was just such a position, nothing more. I was employed by the Lowell Rubber Co., a retail concern. The first thing I had to learn was how to sweep a floor properly. I delivered packages all over the city, helped move big cases of goods, made myself generally useful, and, being the 'office boy,' was at general beck and call.

"There were no parcel deliveries in Lowell at that time, and not all the retail stores owned delivery wagons. That was thirty-three years ago. I had to work from 7 o'clock in the morning until 7 o'clock every night, with 11 o'clock as the closing hour on Saturday nights.

"I must have made good, as the expression is now, for in a short time I was entrusted with the making of sales, and when I had become familiar with the business and the trade I was sent out on the road. In 1889 I had advanced to the point where I was made manager of the Lawrence, Mass., branch, and in 1898 I came to Providence to take charge of the shop in this city. I purchased the business in 1903, thereby controlling a chain of eight stores."

* * *

The American Electrical Works at Phillipsdale, East Providence, report an increasing demand for their products, and are adding to the number of their employes. Recently they have been calling for men in their wire drawing department, offering 20 cents an hour while learning, with an average of $14 to $16 weekly thereafter.

* * *

The State Board of Control and Supply, of which Gilbert R. Parker of Providence is secretary, is making up the forms for bids for supplies for the various institutions throughout the State for six months, commencing July 1. The list includes all the rubber goods of every description used in the institutions.

* * *

John J. Kelley, paymaster of the National India Rubber Co., who has been confined to his home in Warren for the past six weeks with a severe attack of inflammatory rheumatism, has resumed his duties at the Bristol offices. He was warmly congratulated by his friends on his recovery. Frederick Wilson, of the paymaster's department, was acting paymaster during the time Mr. Kelley was absent.

* * *

A new one-story brick building, about 260 feet in length and 160 feet wide, is to be erected within the next few months at the plant of the National India Rubber Co. at Bristol, and three buildings are now being demolished to make room for the new structure, which will be located east of the wire-drawing plant. The new building will be used for the wire-stranding machines. The buildings which are being razed are the old one-story press room, part of the old druggists' sundries room, the one-story building which contains the curing heats, and part of the old two-story calender and gum rooms.

Ground has also been broken for a new one-story shipping shed to extend 146 feet west of the present shipping shed northwest of the wire department. The building will be 70 feet wide and built of wood. A new naphtha storage reservoir, made of cement below the surface of the ground, is being constructed. This will be divided into four compartments or tanks, each of which will have a capacity of 5,000 gallons, so constructed as to be entirely independent of each other.

* * *

The Bourn Rubber Co. of 58 Warren street, this city, has been granted permission by the inspector of buildings to erect a one-story brick workshop in the rear of Westfield street, adjoining the present plant.

THE RUBBER TRADE IN SAN FRANCISCO.

By a Resident Correspondent.

TRADE has quieted down somewhat during the past month, owing to a variety of causes. In the first place there is the tariff. Then the State Legislature has passed measures which big corporations feel to be restrictions on their enterprises, and one measure—the liability of employers for injuries occurring to employes—has also tended to make some big industrial companies feel uneasy. The law as it now stands gives compensation (in all mechanical industries) in cases of those who are injured or killed, even though the injury be the result of the negligence of a fellow employe. This law will affect many employers who are allied with the rubber business, and they are naturally interested in the outcome. The theory of the law is to shift the burden of the financial loss, in the case of accidents, to the employer instead of to the employe, upon the theory that the employer will for this reason be much more concerned for the protection of those in his service.

* * *

Mr. R. H. Pease, president of the Goodyear Rubber Co., of this city, has returned from his eastern trip. He has renewed his contract as Pacific Coast selling agent of the United States Rubber Co. He reports that he found conditions in the East about as they are here. R. H. Pease, Jr., treasurer of the company, is now in Paris, and will return early in June. Upon his return from Europe it is likely that he will take charge of the company's branch in Portland.

* * *

Mr. Brady, general sales manager of the Gorham-Revere Rubber Co., has returned from his trip to the northwest, where he found business very good, especially in Seattle. Mr. W. H. Given, the former manager of the company's branch at Spokane, has resigned, and Henry Thompson has been placed in charge of that store. Mr. Thompson was formerly manager of the Portland branch store. The new manager of the Portland branch will be W. G. Roope.

* * *

M. E. Morris, recently appointed Pacific Coast district manager of the Goodyear Tire and Rubber Co., of Akron, succeeding W. T. Powell, has arrived in this city, accompanied by his wife and daughter. This being district headquarters, Mr. Morris has been getting acquainted with the big establishment on Van Ness avenue. He is accompanied by C. W. Martin, manager of the truck tire department of the company, and also by L. C. Rockhill, manager of the pneumatic tire department. The latter two will make semi-annual trips to this territory. They have been busy conferring with Manager Frank Carroll of the local branch, and are about to start for a trip through the cities of the northwest.

Mr. H. T. Dunn, president of the Fisk Rubber Co., has been visiting in San Francisco, and while here is making his headquarters with Mr. Pratt, manager of the local branch. Mr. Dunn is very well pleased with the progress which the tire industry is making on this coast. In his belief, the automobile industry must thank the tire manufacturers to a large extent for the increasing popularity of the automobile, which is largely due to the increased efficiency and better service of automobile tires.

* * *

W. H. Bell, Pacific Coast manager of the Firestone Tire and Rubber Co., reports that the tire business is keeping up to its high standard of activity on this coast. Mr. Bell keeps well posted not only on the commercial demand for tires, but also on all improvements in tire construction, and is a strong believer in the idea that the longer a manufacturer can make a tire last the greater will be the ultimate demand for its general use. Improvements on the rims, to keep the dust and rocks out, are important, he says, and also improvement may be looked for in the matter of fibres of which the fabric is composed. The best that are now to be obtained are the fibres of natural grown plants, and it is really the toughness and efficiency of the fabric which goes to make up the life and efficiency of the tire.

THE RUBBER TRADE IN TRENTON.

By a Resident Correspondent.

C. H. OAKLEY, president of the Essex Rubber Co. and William G. Grieb, of the Ajax-Grieb Rubber Co., local concerns, were two of the committee of four representing the rubber manufacturers of this country which presented to Congress a joint memorandum on the Underwood tariff bill, as to the necessity of granting a measure of protection in the matter of tariff considerably in excess of that contemplated by the Democratic administration.

Other Trenton rubber manufacturers who assisted in the preparation of the appeal to Congress were: W. H. Sawyer, of the Mercer Rubber Co.; R. J. Stokes, Thermoid Rubber Co., and J. K. Pellinger, Morrisville Vulcanite Rubber Co.

The Finance Committee of the Senate received the committee at the hearing, which lasted about two hours. Mr. Oakley and Mr. Grieb both spoke against the contemplated action of the administration. The memorandum presented represented factories producing an annual output of $75,000,000 worth of rubber goods, a great portion of which is manufactured in this city.

* * *

Tibor Miklos, administrator of the estate of John Mikulas, has instituted suit in Mercer Supreme Court to recover $10,000 damages for the loss of the life of the deceased. Mikulas was killed in one of the rubber mills some months ago, as the result of the explosion of a vulcanizer. It is charged that the machine was defective, and that it was improperly and unskillfully operated.

The reputation of Trenton as the home of expert tire makers is again borne out by the effort to induce local men to accept positions in other sections of the country. The Akron Rubber Co., Akron, Ohio, has run large advertisements in the local newspapers calling the attention of workmen to the advantages of locating in the Ohio town. A rubber company at Rutherford, New Jersey, another in New York State and a New England concern have advertised in the local newspapers for tire makers, offering all kinds of inducements.

THE SENATE HEARING ON THE TARIFF.

About the middle of May there was a meeting of rubber manufacturers held in New York City, and a committee of four was appointed to present a memorandum on the Underwood Tariff Bill before the senate committee, which was holding Tariff hearings at that time. The committee consisted of F. A. Seiberling, president of the Goodyear Tire and Rubber Co., Akron, Ohio; Geo. B. Hodgman, president of the Hodgman Rubber Co., New York; William G. Grieb, of the Ajax-Grieb Rubber Co., and C. H. Oakley, president of the Essex Rubber Co., of Trenton.

These representatives of the rubber trade were cordially received by members of the senate committee, and were given an opportunity to state their reasons for opposing the reduction in duty on manufactured rubber goods from 35 to 10 per cent. Besides these four members of the committee, a number of other manufacturers, including several of the leading Trenton manufacturers, were present and took part in the discussion.

PROPOSED REDUCTIONS IN DUTIES ON MANUFACTURES OF RUBBER.

BY the annexed table the differences between the present and proposed duties on rubber manufactures are shown in more complete form than in the table published in the May issue of THE INDIA RUBBER WORLD (page 404). There is a sweeping reduction to the extent of about 70 per cent. of present duty on rubber manufactures in general, a reduction of 60 per cent. on cables, of 50 per cent. on belting of cotton and rubber and on waterproof cotton cloths, and of 45 per cent. on tire fabrics.

Webbings containing india rubber would pay duties as now according to the other materials of which they are composed. Wool webbings have hitherto paid a compound rate equalling a figure (according to cost per pound) from 68.94 per cent. to 148.40 per cent., nine-tenths of the quantity paying 84.13 per cent. The proposed reduction to 35 per cent. will be a serious one for makers of this class of web, who, however, would benefit by the free wool clause of the new tariff.

India rubber enters into the composition of so many articles that it is difficult to define just how far the effects of the new tariff would reach. But the annexed figures show its incidence as affecting the principal branches of manufacture.

COMPARISON OF PRESENT AND PROPOSED DUTIES ON MANUFACTURES OF RUBBER.

Present (Payne) Rates.		*Proposed (Underwood) Rates.*		
		Paragraph.		
Manufactures of india-rubber	35 per cent.	378—Manufactures of india-rubber or gutta-percha	10	per cent.
Rubber sponges	40 per cent.	379—Manufactures of vulcanized india-rubber known as "hard rubber"	25	per cent.
Manufactures of gutta-percha	35 per cent.			
Cables, etc. (1c. per lb. + 40 per cent.)	51.86 per cent.	116—Telegraph, telephone and other wires and cables composed of metal and rubber, or of metal, rubber and other materials	20	per cent.
Cotton and rubber belting for machinery	30 per cent.	267—Belting for machinery made of cotton or other vegetable fiber and india-rubber	15	per cent.
Waterproof cotton cloth (10c. per sq. yd. and 20 per cent.)	50.56 per cent.	259—Waterproof cloths composed of cotton or other vegetable fiber, whether composed in part of india-rubber or otherwise	25	per cent.
Suspender webbing—*Cotton*	45 per cent.	267—Fabric, suitable for use in suspenders and braces, of cotton or other vegetable fiber and india-rubber; not embroidered	25	per cent.
Fibres other than cotton	45 per cent.	287—Webbings of flax, hemp, or same and india-rubber	30	per cent.
Composed of wool, etc, chiefly	84 per cent.	301—Webbings of wool, etc	35	per cent.
Of silk	50 per cent.	324—Webbings of silk, etc	40	per cent.
Tire fabrics	45 per cent.	267—Tire fabrics, etc	25	per cent.
Cotton ducks (minimum)	45 per cent.	271—Cotton cloths (minimum)	30	per cent.
Clothing of silk and india-rubber	60 per cent.	325—Clothing of silk and india-rubber	50	per cent.

New Rubber Goods in the Market.

THE TYER "HOLD-TITE" TIRE.

THE Tyer Rubber Co., of Andover, Masachusetts, makers of the Tyrian rubber goods, have incorporated the letter T in the tread of their "Hold-Tite" anti-skid automobile tire. There are two rows of these T-shaped depressions. The heads abut a strip of uncut rubber which extends around the tire at its greatest circumference. As the greatest amount of wear comes on this point it should have excellent wearing qualities.

SHAVING WITHOUT SOAP OR CUP.

Simplification is the great law of civilized conveniences.

Here is a shaving brush called the "Selfeedo" that combines in itself the work of a brush and the offices of a shaving cup. The handle, which is made of hard rubber, is hollow and is in two parts, the outer part working on a screw over the lower. In the hollow handle enough shaving cream

THE SELFEEDO SHAVING BRUSH WITH HARD RUBBER CASE.

can be stored for 100 days' use. When the shaver is ready for operations he simply dips the bristles into water, give the top of the handle a quarter turn, and that forces a sufficient amount of cream down into the bristles for the morning's shave.

The brush is put up in a hard rubber case, so that a man can carry his shaving outfit in his waistcoat pocket. (Baird-North Co., Providence, Rhode Island.)

"SOLID AIR."

A new tire filling compound is mentioned in the French technical press, which can be injected in a liquid state into tires at different degrees of tension, to correspond with the weight and normal load of the vehicle, as well as the size of the tire casing. After a few hours the injected liquid becomes plastic, generating gas in millions of cells. It is said to be compressible and inextensible, differing from rubber, which is incompressible and extensible.

Replete with Information for Rubber Manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

NEW STYLES OF WATERPROOF GOODS FOR WOMEN.

THE latest catalogs issued by the most progressive New York manufacturers and dealers in women's waterproof goods contain some very attractive designs, three of which are here reproduced:

No. 1 shows a raincoat of rubberized silk mohair and is very light in weight. It has a high standing turnover collar and a slot pocket on each side. Accompanying this raincoat there is a convenient auto hood, as shown in the picture.

No. 1. No. 2. No. 3.

SOME NEW PATTERNS OF WATERPROOF GARMENTS.

No. 2 shows a more mannish design. This is made of English worsted cashmere with fancy plaid rubber back, and comes in castor, tan, navy or black. It has patch pockets, inlaid velvet collar and loose-belted back.

No. 3 is a raincoat of light weight spun silk Ottoman cloth with rubber back. This is made in castor, taupe, navy or black. It has a soft, convertible collar, patch pockets and a detachable half belt at the back.

A NEW PREPARATION FOR AUTO TOPS.

Rubber has contributed not only in a thousand ways to the comfort of living, but it is continually contributing to the wealth of our vocabulary. Every day some new word born of rubber appears in print. Here's one of the latest—"RUB-R-TITE." It is the name of a preparation for use on worn-out and leaky automobile and carriage tops. It is alleged to renew and render waterproof any sort of fabric, whether mohair, pantasote, leather or cravenette, re-filling and re-surfacing the fabric. The manufacturers do not tell what it consists of, but they say that it is neither a paint nor a varnish, and that it puts an elastic, durable coating on the auto top. Its name seems to warrant the assumption that it contains at least some suggestion of rubber. (Rub-On Manufacturing Co., Buffalo, New York.)

News of the American Rubber Trade.

McGRAW CAPITAL STOCK $1,000,000.

THE McGraw Tire and Rubber Co., of East Palestine, Ohio, has been incorporated, with a capital stock of $1,000,000, to manufacture rubber tires and various other rubber goods and automobile accessories. The incorporators are: E. C. McGraw, Lenore H. McGraw, Robert W. McGraw, James C. Chaplin, C. H. Bolton, John S. Wilson, George Flaccus, John Morgan, R. F. Taggart, R. B. Taggart, J. C. Chamberlin, H. C. Fraser and C. L. Merwin.

18 NEW MOTORS FOR BOSTON WOVEN HOSE COMPANY.

THE Boston Woven Hose and Rubber Co., Cambridge, Massachusetts, will put into operation in its plant eighteen new motors ranging from 15 to 400 horsepower, oil switches with transformers and controller panels. All this equipment will be furnished and installed by the General Electric Co. The General Electric Co. will also install very soon in the plant of the Empire Gypsum Co., Garbutt, New York, a new electrical drive apparatus consisting of one 10 kv-a. and three 150 kv-a. transformers, fourteen motors ranging from 5 to 100 horsepower, switchboard apparatus and accessories.

RUBBER AND GUAYULE AGENCY, INC.

A COMPANY has been incorporated under the laws of the State of New York with an authorized capital of $60,000, under the name of "Rubber and Guayule Agency, Inc.," for the purpose of doing business as brokers, agents and importers of crude rubber, guayule, balata and kindred products. Edward Weber will act as the general manager of the concern, and the board of directors will consist of Edward Weber, president and treasurer, Cornelius Schroeter, and Albert F. Hill, secretary.

The Rubber and Guayule Agency is acting as sole agent for a number of leading firms in Hamburg, Antwerp, London and other European markets, as well as for Colombo and Singapore firms. It is also sole agent for Madero's Sol & Gallo brand guayule, and for the Toro brand of the Cia. Mexicana Explotadora de Hule.

THE GORDON RUBBER CO. ADDS TO THEIR PLANT.

The Gordon Rubber Co., Canton, Ohio, manufacturers of seamless and hand-made rubber sundries, is adding two large buildings to its plant—one being 200 x 40 feet, the other 165 x 40 feet. These will be used in the manufacture of druggists' sundries, auto tires, tubes and other specialties.

WHY THE PRICE OF FEDERAL TIRES WAS REDUCED.

ON the 4th of May the Federal Rubber Manufacturing Co., of Milwaukee, advertised a reduction averaging rather over 10 per cent. on the "Rugged Tread" Federal tire in sizes running from 32 x 3½ inches to 38 x 5½ inches. Because of their quality, these "Rugged Tread" tires had previously been sold at a somewhat higher price than other tires, but owing to increased manufacturing facilities and the larger demand for these tires it was found possible to lower the price somewhat while still maintaining the quality; consequently the company decided on this reduction.

$5,000 IN PRIZES TO TIRE USERS.

THE Ajax-Grieb Rubber Co. has offered 208 prizes, amounting all told to $5,000, to the chauffeurs who will make the best record with their tires during the year ending March 31, 1914. The first prize amounts to $500, the second $300, and the third $200. Then there are five prizes of $100 each, and numerous smaller prizes. Those who want to enter the competition should secure the proper blanks from the company, which will show them just what it is necessary to do in order to compete successfully.

THE RUBBER CLUB OUTING.

The midsummer outing of the Rubber Club of America is set for the 15th of July. It will be held as usual in or near Boston, and the committees are preparing a program that bids fair to be by far "the best yet."

ONE WAY TO AVOID LABOR TROUBLES.

On Saturday morning, May 10, Mr. J. K. Williams, president of Williams Foundry and Machine Co., Akron, Ohio, assembled all the employes of his factory and presented each one of them with an envelope containing a sum of money, and a card with the following matter:

"The Williams Foundry and Machine Co. has completed another successful year, and its directors, knowing that its prosperity is largely due to the efforts of its faithful workmen, have decided to recognize their services in a substantial manner."

After explaining the method of distribution the card continued: "We trust that we may have your help in making the year 1913 even more successful, and that future disbursements of this kind will be possible."

While this distribution was a surprise to the employes, still they had had some previous preparation for it, because last year a similar though smaller distribution was made. It might be added that labor troubles are practically unknown in this shop.

THE MONATIQUOT BIRTHDAY MAT.

The Monatiquot Rubber Works Co., which manufactures in its factory at South Braintree, Mass., various brands of "Naturized Rubber" with good old historic Indian names, celebrated its third birthday anniversary, which occurred on April 19, by presenting its customers and friends with a fine specimen of "Naturized" rubber in the form of a useful and convenient rubber mat. It is eight inches in diameter, artistic and attractive in design, and of a copper-red color, which goes appropriately with the celebrated Indian names used by the company. It can be used as a pitcher mat, coin mat, or in a hundred other ways.

THE CANADIAN CONNECTICUT COTTON MILLS, LIMITED.

THE Canadian Connecticut Cotton Mills, Limited, recently incorporated, will start soon on the work of erecting a plant at Sherbrooke, Quebec. It is expected that the plant will be completed and in operation by the first of next January. This company has authorized capital stock of $1,750,000. The president is H. L. Burrage, the vice-president R. J. Caldwell, and the treasurer and buyer Tracy S. Lewis. Mr. Lewis is president and Mr. Caldwell vice-president of the Connecticut Mills Co., of Danielson, Connecticut, which manufactures automobile tire fabrics. The new Canadian company will manufacture special cotton fabrics, presumably for automobile tires.

ALLIANCE RUBBER CO. ALREADY MANUFACTURING.

THE April issue of THE INDIA RUBBER WORLD contained a statement regarding the incorporation of the Alliance Rubber Co., of Alliance, Ohio, giving the names of the incorporators, the amount of capital and a brief description of the building plan. This building has not yet been completed, but the company hopes to have it in condition to occupy by July 15. It will be used for the manufacture of inner tubes, druggists' sundries, hand-made, molded and dipped; gloves for the surgical, household and electric trade; toy balloons and mechanical goods. The company is already doing some manufacturing in the line of dipped goods, in a temporary factory which will be used until its new plant is completed.

MR. R. L. CHIPMAN BECOMES A BROKER.

Mr. R. L. Chipman has opened an office as a crude rubber broker at 290 Broadway, New York. Mr. Chipman was for 14 years connected with Geo. A. Alden & Co. and the New York Commercial Co. and has a very wide acquaintance in the rubber trade. He graduated from Harvard in 1898 and for the next two years was in the Boston office of Geo. A. Alden & Co. Then he represented that concern for two years at their Akron office,

R. L. CHIPMAN.

where he became acquainted with the Western and Canadian trade. He then returned to the Boston office and remained there until January of the present year, when he joined the forces of the New York Commercial Co. Since this company went into the hands of a receiver Mr. Chipman has been assisting Mr. De Long in untangling and adjusting its affairs—until the opening of his own office about the 20th of May.

Owing to his experience and the large number of friends he has made in the trade it is quite safe to say that Mr. Chipman will enter at once upon a successful career.

MR. SYMINGTON'S VISIT TO AMERICA.

Mr. William Symington, head of the firm of William Symington & Co., Ltd., London, sailed for home from New York, May 10, on the *Caronia*, after a visit of two or three weeks in this country and in Canada. The firm of Wm. Symington & Co., Ltd., handles the crude rubber business of the United States Rubber Co. in London, and Mr. Symington came over, primarily, to confer with the officers of that company and also of the General Rubber Co., through which the United States Rubber Co. purchases its crude rubber supply. The "Boston Financial News" contained a very interesting interview with Mr. Symington a few days before he sailed, in which he gave his views relative to the rubber outlook in the Middle East and in the trade generally. He is quoted as follows:

"In the Middle East all told there were about 1,500,000 acres planted at the close of 1912, which will be in full bearing in 1919. So far as we can estimate, the total annual output of that planted acreage will be 300,000 tons of crude rubber. The world's consumption now is approximately 120,000 tons. Of course, between these two sets of figures there is still a rather wide margin, but it must be remembered that the output is increasing at a very rapid rate.

"The exports of plantation rubber from the Federated Malay States and Straits Settlements for the first quarter of this crop year showed an increase over the corresponding three months of last year of 70 per cent. On this basis this year's crop will be 50,000 tons, which will represent a very substantial increase over last year's. This estimated output of plantation rubber for the current year will be in excess of the Amazon crop, which was 43,000 tons for the calendar year 1912."

Mr. Symington, speaking of the tremendous increase of plantation rubber, says that unless new uses are found for it, production will soon greatly exceed consumption; and he states that in Europe representatives of some of the large producing companies are offering manufacturers a certain amount of crude rubber free of charge, to be used for experimental purposes with a view to finding new uses for the product. But he is not at all a pessimist on the situation, for he calls attention to the fact that the crude rubber supply of the world ten years ago was only 50,000 tons, while now it is 120,000 tons. That is, in ten years' time the production of crude rubber has increased nearly two and a half times and yet the consumption has fully kept pace with this increase, so that rubber is selling no lower now than it was ten years ago.

MR. GILBERT LEAVES TIRES FOR AUTOS.

The resignation of Mr. J. M. Gilbert from the general managership of the United States Tire Co.—which occurred the last of April—came as a surprise to most people in the trade. This step however, was fully explained when immediately after his resignation he was elected president and general manager of the Lozier Motor Co., of Detroit.

Mr. Gilbert has been a prominent figure in the tire industry for a number of years. He has been associated with rubber manufacture for the last twelve years. Two years ago he was general manager of the Continental Caoutchouc Co., one of the constituent companies of the Rubber Goods Manufacturing Co. At that time—in March, 1911—the United States Tire Co. was formed, embracing the Continental Caoutchouc Co., Morgan & Wright, the G. & J. Tire Co., and the Hartford Rubber Works Co., all belonging to the Rubber Goods Manufacturing Co. It was currently reported that Mr. Gilbert was largely instrumental in bringing about this consolidation of interests and in gradually supplanting these four individual brands of tires by the United States Tire Co. brand.

The annual reports of the Rubber Goods Manufacturing Co. show that the business of its tire department during the last two years has been most successful, and it is stated that the first months of the present year indicate an increase of over 40 per cent. in volume of sales over the corresponding months of last year.

After the announcement of Mr. Gilbert's resignation there was much speculation as to who would succeed him as general manager of the tire company, but this speculation has been quieted by the action of the directors of the United States Rubber Co., who, at their annual meeting for the election of officers —held May 23—elected Elisha S. Williams—president of the Rubber Goods Manufacturing Co.—to be "general manager of the tire, mechanical and miscellaneous business of the company, both manufacturing and selling."

A testimonial dinner was tendered Mr. Gilbert early in May, at the New York Athletic Club, by his former associates in the tire company, and he was presented with a handsome combination cellarette and humidor.

RUBBER REGENERATING CO. TO HAVE A NEW YORK LABORATORY.

The Rubber Regenerating Co., recently purchased by the United States Rubber Co., is to have a well-equipped laboratory in New York City, and the four-story-and-basement building, located on the northeast corner of Eleventh avenue and Fifty-eighth street, has been leased for a term of years for this purpose.

TRADE NEWS NOTES.

A branch of the St. Louis Tire and Rubber Co., of St. Louis, has recently been opened in Chicago. It is located at 2027 Michigan avenue and is in charge of Mr. Alexander Hendel.

Walpole tires will be distributed in the southern part of New York State and the State of New Jersey by Meyers & Grayson, 1608 Broadway, New York.

The Goodyear India Rubber Glove Manufacturing Co., one of the constituent plants of the United States Rubber Co., is making arrangements to increase its office space by a two-story addition.

The F. S. Carr Co., of South Framingham, Massachusetts, has just started on a four-story brick and cement building 150 x 75 feet, and a one-story frame building 200 x 60 feet. These additions will practically double the capacity of the plant.

One of the most successful lines of fire hose now on the market is the wax and Pará gum-treated cotton rubber-lined fire hose made by the Fabric Fire Hose Co., with factories at Sandy Hook, Connecticut, and offices at 127 Duane street, New York. The manager of this company, Mr. William T. Cole, is one of the best known rubber men in the trade, and his administration of this company is responsible for one of the most complete and effective organizations of its kind in this country.

Theodore Hofeller & Co., of Buffalo, large dealers in old rubber, have distributed some color barometers in the form of little cards to be hung upon the wall, which, by the changing color in the piece of sensitized cloth, indicate whether we may expect fair weather, rainy weather or a change of any kind. It is perhaps not quite as accurate as the government barometers, but it serves its purpose.

W. F. Gammeter, of Cadiz, Ohio, who manufactures Universal Steel Calender Stock Shells, had a very wide distribution for his product in the last week in May. He not only made shipments to Boston, Lowell, Woonsocket and various other New England points, and to Buffalo, Wilkes-Barre, Trenton, Akron, Cleveland and other middle state and middle west localities, but he sent shipments to various places in Ontario, some to California and some as far away as St. Petersburg, Russia.

The Mexican Mutual Planters Co. has moved its offices from 167 West Washington street to 123 West Madison street, Chicago, Illinois.

COSHOCTON TO HAVE A RUBBER PLANT.

THE town of Coshocton, Ohio, is to have a rubber factory. The S. & M. Tire and Rubber Co., capitalized at $400,000, has signed a contract with the representatives of the Coshocton Board of Trade to locate a factory in that town. The town contributes two acres of land with a factory building formerly used for another purpose, and it is expected that the citizens of the town will subscribe to $100,000 worth of stock. The company expects to remodel the factory building at once, and hopes to be manufacturing tires within three months. It intends at the start to employ 200 men, and expects within the next two years, at any rate, to increase this number to 500.

THE COLUMBIA RUBBER CO.

THE Columbia Rubber Co. has been incorporated, the promoters being the owners of the L. & M. Rubber Co., of Carrollton, Ohio, to manufacture rubber tires in a factory now being built at Columbiana, Ohio. It is expected that the factory will be completed by July 1, with a capacity of 300 tires per day. The capital stock is $1,000,000, and the officers are: E. L. Henderson, president; A. E. Albright, secretary, and J. H. Richards, treasurer.

The directors of the Boston Woven Hose and Rubber Co. have declared a semi-annual dividend of three dollars per share on the preferred stock, and a quarterly dividend of three dollars per share on the common stock, both payable June 16, 1913, to stockholders of record June 5, 1913.

THE RUTHERFORD CO.'S NEW BRANCH.

THE Rutherford Rubber Co., Rutherford, New Jersey, has just opened a new branch in Boston, at 53 Church street, near Park square. In addition to this Boston store it has branch stores at 438 West Forty-second street, New York City; 240 North Sixteenth street, Philadelphia, and in Bridgeport, Newark and Reading.

An item has recently appeared in some of the papers to the effect that the Rutherford company is increasing its capital stock. This, however, refers to an increase which took place last December, when $200,000 additional preferred stock was issued, making the present capitalization consist of $500,000 preferred 7 per cent. cumulative stock and $300,000 common stock. This increased stock was issued to take care of certain extensions in the business and for the purpose of opening further sales branches.

A VERY CONVENIENT SHIPPING BOX.

"The Behrendt Knock-Down Shipping Box" ought to be a great convenience to almost every shipper. It is constructed entirely of galvanized sheet iron (24 or 26 gg.), and while it weighs only half as much as the ordinary wooden box, it is strong enough for the heaviest merchandise or machinery. In its collapsed state it stands only 4 inches high and can be put together by a boy in a few minutes. It can be locked up in a minute and opened just as quickly. It has no visible nails, screws or bolts. It can be skidded around like any ordinary box, and can be used over and over again, as it is practically indestructible. It is made by the Metal Package Corporation, of Newark, New Jersey.

REPORT OF THE CONSOLIDATED RUBBER TIRE CO.

The annual report of the Consolidated Rubber Tire Co. of New York for the year ending December 31 last, recently published, shows that during the year $4,276,993 worth of goods were sold, an increase of $893,461 over the previous year. The total income of the company from all sources during 1912 was $4,513,358, while the expenses amounted to $4,399,338, leaving a net profit of $114,020.

THE ECONOMY OF THE AUTO ENGINE.

In an address given by Ex-Chief Loller of Youngstown, Ohio, at the recent semi-annual meeting of the New Jersey Fire Chiefs' Association, he made this statement, showing the comparison between the horse drawn steamer and the auto engine:

"The first motor engine placed in service in Ohio was of the Webb type. During the recent flood it worked from 7 o'clock on Sunday morning until the following Monday night, taking suction from the river, which was covered with oil and other waste. The same engine was used to pump out cellars, and I do not think a steam engine could have done any better. In fact, I think the automobile engine proved to be a little better than the steamer. From the point of economy it is far ahead. Three men are required to operate a steamer and take care of horses, besides the expense of fuel, while only one man was needed for the automobile engine, and half the time he was strolling around with his hands in his pockets. From the point of operation, the auto engine costs about one-sixth of the amount needed to run a steamer. The tire question is the largest item in the automobile expense list, although I had a machine equipped with one set of tires which lasted three years, and they were pneumatic tires at that. Several solid and cushion tires are now being manufactured which nearly approach the pneumatic in resiliency."

THOSE RUBBER EARS AND NOSES.

THE "New Goods" department of this publication described and illustrated in the May issue the rubber ears and noses manufactured by a surgical appliance house of New York City. These artificial members were ascribed, in that article, to the well-known New York surgeon, Dr. William B. DeGarmo. That was an error. They should have been attributed to the G. J. DeGarmo Co., 33 West Forty-second street.

WILLIAM E. BARKER MANAGER OF SALES.

Those students of human affairs who champion the theory that only homely men ever get very far, thought that their case was proved for all time when Mr. Wilson went to the White House and Mr. Sulzer was sent up to Albany; but they have since received a tremendous set-back, for on the 8th of May their theory was utterly exploded by the appointment of Mr. William E. Barker to the position of Manager of Sales of the United States Rubber Co.

Mr. Barker is not so very venerable—some little time has still to elapse before he reaches the half century mark—but notwithstanding that fact he is one of the veterans of the rubber industry, for his rubber career runs back to the early 80's, when he became

WILLIAM E. BARKER.

connected with Charles M. Clapp & Co., who had a large and successful store on Devonshire street, Boston, and who were, in addition, proprietors of the Aetna Rubber Mills of Roxbury, Massachusetts.

Mr. Barker stayed with this company for seven years and when he left had reached the position of general manager. It would have been impossible to select at that time, or in fact at any time since, any place in the rubber trade where seven years could be more profitably spent. Mr. Clapp was not only a very successful manufacturer and merchant, but he was a man of large vision and held an important position in commercial and civic affairs. Anyone who spent seven years with him without having all that was good in him made still better would be a psychic phenomenon.

After leaving this company Mr. Barker was for a year with the selling agents of the Pará Rubber Co., and then, in 1891, he started the Enterprise Rubber Co. of Boston, being made its president, a position which he still holds after 22 years of office. In 1909 the branch store system of the United States Rubber Co. had grown so large and was such an important channel of distribution, that the management decided that it was desirable to have some capable person take full charge of all the merchandise distributed through these stores—and Mr. Barker was put in that position, with the title of Merchandise Manager of Branch Stores. This practically made him a sort of first lieutenant to Mr. E. R. Rice, the manager of sales. It was natural, therefore, that the directors, on Mr. Rice's death, should look upon Mr. Barker as his logical successor.

The position of Manager of Sales of the big corporation is a highly important one. It has been filled in the past by such notable figures in the trade as Charles L. Johnson and Eben H. Paine.

MR. MAYO APPOINTED TO AN IMPORTANT POSITION.

Mr. Geo. H. Mayo has been made "Merchandise Manager of Branch Stores" of the United States Rubber Co., in place of Mr. Barker, who has recently been promoted to the position of manager of sales.

Mr. Mayo was born in Chelsea, Massachusetts, in 1875, which, it will be noticed, places him on the safe side of the line at which Dr. Osler says men should normally be chloroformed. Though born in Chelsea, Mr. Mayo evidently never came under those devitalizing influences which—around Boston, at any rate—are so generally attributed to the city of Chelsea, for he was only 19 years old when, having graduated from the famous Boston English High School, he was hard at work in the large and important wholesale distributing house of Wm. H. Mayo & Co., of which his father was the head. At that time they distributed leather footwear and rubbers, but in 1900 they devoted themselves exclusively to rubber footwear, and from that time on handled all the damaged goods of the United States Rubber Co., which had previously been sold at auction. It is currently reported that the Mayo company has done not so badly in this exclusive field.

GEORGE H. MAYO.

Five years after entering the rubber business, and at the age of 24, Mr. Mayo had become a partner in the firm, and his work there made such an impression upon the selling department of the United States Rubber Co. that when it was found desirable to add three new branch stores to the company's list, to sell the new "Hub-Mark" brands in Boston, New York and Detroit, these stores were put in Mr. Mayo's charge. This was a year ago. Evidently he has given a good account of himself in the management of these three branch stores, for he is now promoted to the general management—as far as control of the merchandise is concerned—of all the company's branch stores, which fairly comfortably cover the map of the United States—at least that part of it where rubbers are chiefly sold and worn.

If the charge should be brought against Mr. Mayo that he has climbed rather rapidly, the defence could be made for him that he was compelled to, being constructed exclusively on climbing lines.

The United States Tire Co. is making rapid progress in the transformation of its big Detroit plant, and expects to make it the largest tire factory in the world.

NEW INCORPORATIONS.

Couch-Georger Tire Agency, Inc., May 3, 1913; under the laws of New York; authorized capital, $10,000. Incorporators: C. A. Couch, E. F. Howell and Frank P. Georger—all of Buffalo, New York. Location of principal office, Buffalo, New York.

Gaulois Tire Corporation, April 24, 1913; under the laws of New York; authorized capital, $20,000. Incorporators: Jean Grenier, 49 West 64th street, Victor W. Cutting and Maurice Leon—both of 60 Wall street, New York. Location of principal office, New York.

Globe Rubber Tire Manufacturing Co., May 6, 1913; under the laws of Delaware; authorized capital, $1,500,000. Incorporators: Harry B. James, Sherman Square Hotel, 72nd street and Broadway, New York; Joseph P. Hall, 60 Hawthorne avenue, East Orange, and Spencer Weart, 273 Washington street, Jersey City—both of New Jersey. To maunfacture rubber tires and inner tubes for automobiles and other vehicles.

The H-H-H Tire and Manufacturing Co., Inc., May 3, 1913; under the laws of New York; authorized capital, $50,000. Incorporators: John Dravis, William C. Burroughs and John J. Coyle—all of 1777 Broadway, New York. Location of principal office, New York. To manufacture and deal in rubber tires, etc.

The Harper Tire and Rubber Co., March 3, 1913; under the laws of Ohio; authorized capital, $100,000. Incorporators: Warren D. Harper, James Thomas, and Albert H. Vayo. Location of principal office, Canton, Ohio. To manufacture and deal in automobile tires.

Interchangeable Rubber Heel Co. Inc., May 10, 1913; under the laws of New York; authorized capital, $50,000. Incorporators: H. W. Crane, Hotel Windsor, Philadelphia, Pennsylvania; George A. Mathesius, 108 West 90th street, New York, and John F. Krohn, 834 Hudson street, Hoboken, New Jersey. Location of principal office, New York.

The McGraw Tire and Rubber Co., April 8, 1913; under the laws of Ohio; authorized capital, $1,000,000. Incorporators: E. C. McGraw, Joseph C. Chaplin, and C. H. Bolton. Location of principal office, East Palestine, Ohio. To manufacture and deal in rubber tires, rubber goods, etc.

Northwestern Tire Co., April 19, 1913; under the laws of Illinois; authorized capital, $2,000. Incorporators: George A. Chritton, N. B. Dearborn and L. Holzhalb. To make and deal in automobile tires and accessories, and to do a general vulcanizing business.

Para Rubber Manufacturing Co., Inc., May 2, 1913; under the laws of New York; authorized capital, $2,000. Incorporators: Victor Lowenberg, 1980 Seventh avenue; Simon Lifshitz, 1557 Second avenue, and Nathaniel Loewenberg, 980 Simpson street, New York. Location of principal office, New York.

The Quality Tire and Rubber Co., May 9, 1913; under the laws of Ohio; authorized capital, $10,000. Incorporators: E. E. Smith, J. D. Guthrie, and E. D. Smith. To manufacture and deal in tires, tubes, casings, etc.

Rubber and Guayule Agency, Inc., May 14, 1913; under the laws of New York; authorized capital, $60,000. Incorporators: Albert F. Hill, 44 Cottage Place, Englewood; Cornelius Schroeter, 123 Shippen street, Weehawken Heights—both of New Jersey, and Edward Weber, 3495 Broadway, New York. Location of principal office, New York.

Specialty Insulation Manufacturing Co., Inc., May 6, 1913; under the laws of New York; authorized capital, $30,000. Incorporators: Michael Casey, 164 Bartlett avenue, William P. Wood, 48 Onota street—both of Pittsfield, Massachusetts, and Clinton Bateholtz, Hoosick Falls, New York.

The Swinehart Tire and Rubber Co., of New Jersey; March 11, 1913; authorized capital, $10,000. Incorporators: Irving D. Stone, Yale Club, New York; Charles S. Kingsbury, 260 16th street, Brooklyn, New York, and Francisco L. Godinez, 123 Duncan avenue, Jersey City, New Jersey. Location of principal office, 211-213 Halsey street, Newark, New Jersey. To acquire, take, and hold the absolute wholesale and retail agency of the Swinehart tire for the State of New Jersey.

United Rubber Tire Co., March 20, 1913; under the laws of Illinois; authorized capital, $1,000. Location of principal office, 1427 South Michigan avenue, Chicago, Illinois. To manufacture and deal in automobile tires, tubes and other accessories.

BRISTOL'S RECORDING DIFFERENTIAL PRESSURE GAUGES.

A NEW and comprehensive line of Recording Differential Pressure Gauges has been developed by the Bristol Co., of Waterbury, Connecticut. Some of these recorders have been in successful service continuously since the preliminary models were first sent out in 1908, and the design and construction of the line of these instruments now being placed on the market is based on results obtained in actual service during the last four years. These recording differential pressure gauges are adapted for use in connection with venturi meters, pitot tubes, orifices, combinations of orifices and pitot tubes; to record velocities and volumes of air, gas, steam, water and other liquids flowing through mains and pipes. These recorders may also be used to advantage for recording differences and variations of liquid level in steam boilers, pressure tanks, filter beds and process kettles.

BRISTOL'S PATENT RECORDING DIFFERENTIAL PRESSURE GAUGE.

Important patents dated September 12, 1911, and September 17, 1912, have been issued to Prof. Wm. H. Bristol, president and founder of The Bristol Co., covering novel features resulting from his pioneer work in developing differential recorders in addition to the other numerous lines of well known Bristol recorders which he has originated during the twenty-four years which have elapsed since his first patent was allowed on a recording pressure gauge.

The fundamental principle employed in the construction of this differential pressure gauge is that one pressure is applied to the inside of the operating tube, while the other is applied to the outside of the same pressure tube, within a closed casing. In order to record the movement of the pressure tube it becomes necessary to transmit its motion to the outside of the pressure tube casing. As the differential pressure to be recorded is usually small as compared with the static pressure, the operative force is correspondingly small, and it is quite evident that it would be impracticable to use a stuffing box around a shaft passing through a pressure casing, because of the friction which would be produced. To obviate the use of a stuffing box a unique frictionless selling device is employed. The illustration shows the exterior of one type of these recorders.

PERSONAL MENTION.

Mr. W. J. B. Stokes, of the Thermoid, Home and Joseph Stokes rubber companies, arrived from Europe, June 1—having visited the European agencies of the companies named.

Mr. E. E. Wadbrook is back at his place in Arnold & Zeiss' office, fully recovered from his recent indisposition.

Mr. Charles E. Stokes, general manager of the Home Rubber Co., Trenton, New Jersey, has been elected a director in the Trenton Life Deposit and Trust Co.

Mr. I. W. Penniman, formerly with the Goodyear Tire & Rubber Co., has become New England sales manager, with offices at 757 Boyleston street, Boston, for the Walpole Tire & Rubber Co.

Mr. Herbert P. Choate, formerly connected with the Empire Rubber & Tire Co., of Trenton, New Jersey, has recently become sales manager of the Star Motor Car Co., of Ann Arbor, Michigan.

Mr. George Campbell, representing the McIlroy Belting & Hose Co., of Hammond, Indiana, manufacturers of Rubber-Ite Fibre fire hose, left recently for a business trip to European cities, with a view of establishing agencies for the sale of their new style of fire hose.

Mr. Arthur L. Kelley, who, in addition to being a director in the United States Rubber Co., has also for some time been a director in the Rubber Goods Manufacturing Co., resigned from that position at the last annual meeting of the company, owing to considerations of health.

MR. PEARSON LECTURES AT YALE.

Mr. Henry C. Pearson, Editor of THE INDIA RUBBER WORLD, delivered a lecture on May 27 before a body of students of the Sheffield Scientific School—the scientific department of Yale University—on his travels up the Amazon. He delivered this lecture by special request of Professor Hiram Bingham, who has a class which is making a study of South America, its products, development and commercial possibilities.

This lecture was arranged for through Mr. H. Stuart Hotchkiss, vice-president of L. Candee & Co., and himself a Sheffield graduate. Mr. Hotchkiss is deeply interested in this particular class and has favored it with several talks on his travels through rubber countries.

MR. BROADWELL BACK WITH THE FISK CO.

Mr. E. H. Broadwell, who was formerly connected for quite a long time with the selling department of the Fisk Rubber Co. of Chicopee Falls, Massachusetts, and who later went with the Hudson Motor Car Co., of Detroit, has returned to the Fisk Co. and has been elected to the position of vice-president. He will have full charge of the sales of the company.

ALFRED SLACK, GLOBE-TROTTER.

Mr. Alfred Slack, who has been connected with the foreign department of the Tyer Rubber Co. for the last 20 years, with headquarters at San Francisco—but devoting the greater part of his time to traveling over the world at large—arrived in New York May 21 on his way to Andover, after a 13 months' absence, during which he visited practically all the trade centers of the Orient. While Mr. Slack is a selling man and visited the Middle East and the Far West to place orders for tires and the other products of the Tyer Co., he managed to acquire a vast fund of most interesting information regarding the plantations in that part of the world. Incidentally it might be mentioned that Mr. Slack speaks German, French, Spanish, and Portuguese—not to mention several minor languages—as fluently as he does English; and his English is exceptionally fluent.

ALGOT LANGE TO REMAIN IN BRAZIL.

Mr. Algot Lange, author of the book "In the Amazon Jungle," which came out about a year ago and attracted a vast amount of attention, and who also will be remembered for the entertaining lectures which he delivered last fall at the Rubber Exposition, on his travels up the tributaries of the Amazon, has been appointed to a position in the civil service of Brazil, by Dr. Pedro de Toledo, the Brazilian Minister of Agriculture. Mr. Lange was at one time associated with the expedition sent out by the University of Pennsylvania to explore the Upper Amazon, but he resigned from that enterprise some months ago and expects to devote his energies particularly to the "Defesa da Borracha," the important work recently undertaken by the Brazilian government.

MR. JOHN C. COLE IN EUROPE.

Mr. John C. Cole, one of the vice presidents of the Fisk Rubber Co. of Chicopee Falls, Massachusetts, and one of the most popular of the New England rubber men, sailed, with his wife on the "Cedric," May 1, for a two or three months' visit to England and the continent. He will divide his time between advancing the business interests of his company and sight-seeing.

A WELL-KNOWN RUBBER MAN.

The subject of this sketch, W. G. Brown, of W. G. Brown & Co., Cincinnati, Ohio, brokers and dealers in rubber manufacturers' supplies, is one of the best known men in his line, west of Pittsburgh. Mr. Brown has had extensive and successful experience, having started in 1880, with Bart & Hickox, Cincinnati agents of the Boston Belting Co., with whom he remained until 1885, in which year he became connected with the Globe Rubber Works, of Trenton, New Jersey. Subsequent to this Mr. Brown was identified with the Cleveland Rubber Co., as Cincinnati sales agent. In 1893 he became affiliated with the Mechanical Rubber Co., of Cleveland, Ohio, where he opened and managed a branch store covering Ohio, Indiana, West Virginia, and Southern States. In 1902 Mr. Brown discontinued this connection to take charge of the rubber department of Whitman & Barnes Manufacturing Co., Akron, Ohio, and during the last two years of his stay with this house became its general sales manager. In 1905 Mr. Brown organized the Cincinnati Rubber Manufacturing Co., Cincinnati, Ohio, and became its vice-president and general manager, which position he occupied until 1908, when he started the present successful house of W. G. Brown & Co. Mr. Brown is considered an expert judge of crude rubber, and is frequently called upon as an appraiser in the adjustment of crude rubber difficulties. He is also a recognized expert in rubber compounding. Personally, W. G. Brown is of a genial and helpful disposition, and has a host of friends, not only in the trade but in his home city, where he is a prominent member of the Business Men's Club, and until recently was the chairman of the well-known Cincinnati Santa Claus Committee.

W. G. BROWN.

The India Rubber Trade in Great Britain.

By Our Regular Correspondent.

THE BYRNE PROCESS OF CURING RAW RUBBER.

THE Byrnes—there are four brothers—have in the past played an important part in the rubber trade of Birmingham, their interests as manufacturers having been now for some years merged in the Dunlop Rubber Co., one of the family being now prominently connected with the Leyland-Birmingham Co., which absorbed their merchant business so long carried on in Birmingham. I mention these facts by way of indicating that an acquaintance with rubber is no modern acquisition by Messrs. E. J. Byrne and F. A. Byrne, whose names may not be so familiar to many young planters as they are to older manufacturers. Mr. E. J. Byrne has patented a process for curing plantation rubber on the lines so long employed by the rubber gatherers of the Amazon, the process briefly described being the treatment of the coagulated latex with certain wood vapors prepared in a concentrated liquid form, thus being easy to handle and use. This liquid is volatilized in a special portable apparatus, the resultant vapor being passed into the curing chamber where the rubber is subjected to its influence.

The patent is now the property of the Rubber Curing Patents Syndicate, Limited, of Norwich Union Buildings, St. James' street, London; the Messrs. Byrne continuing actively concerned in the management thereof. Following a previous visit of Mr. E. J. Byrne to the Far East, Mr. F. A. Byrne is at present in the Federated Malay States, superintending the installation of the process on many plantations where it has been decided to adopt it. I understand that laboratory tests have proved the superiority of rubber cured by this process over that which has been cured by the other methods in common use, and further, that prominent rubber manufacturers in England have expressed the same opinion as a result of practical tests. While the patentees apparently hold the opinion that the superiority of wild over cultivated Pará rubber is entirely due to the process of curing adopted, I do not understand that they assert that all the plantation rubber cured by their process is equal to fine hard Pará, though they claim in no doubting language that it is superior to all other plantation rubber.

This process does not call for the abolition of the ordinary acetic acid coagulation of the latex, but it is recommended that the amount of acid ordinarily used should be reduced, the coagulation to be effected only in part by the acid and finished by the antiseptic smoking process. The method thus is a combination of the Brazilian and Eastern methods in order to obtain a product with the properties of the former minus its usual large content of moisture. A further object of the patentees is to ensure the production of plantation rubber of uniform quality, which it is apparent can only be done by the general adoption of a standard method. It is stated that after the smoke cure is finished the rubber may contain 8 to 10 per cent. of moisture, and no attempt is made to remove this, it being found in general practice that the moisture evaporates during the time of transit from the plantation to the European mill. In addition to the specific properties conferred on the rubber by the adoption of this process, claim is also made for a reduction of working costs on the estates, as the entire operation from tapping to despatching is reduced to a period of four days.

RUBBER TANNED LEATHER.

Many of the flotations connected with rubber brought out three years ago have had a checkered existence, to put it mildly, while others have come to an untimely end. With regard to rubber tanned leather, however, although from the actual dividend paying view the company has not proved satisfactory to the shareholders, it would be quite erroneous to think that its claims were entirely fallacious. It has taken time and more money than at first anticipated to get the rubber recognized on the market, but this may now be said to have been accomplished, and the present position is that the factory at Ross, Herefordshire, is unable to meet the demand for belting, now that repeat orders from various countries are coming in. At a recent meeting of the company the chairman, Mr. J. M. Craig, outlined a scheme for the formation of a subsidiary company, whereby the further working capital now absolutely necessary could be obtained. No resolution, however, on the point was passed. At the meeting the important statement was made that the company now has 500 customers on its books.

NEW RUBBER GOODS IN THE MARKET.

As some of the novelties referred to under this head in the April issue of the INDIA RUBBER WORLD had a strong domestic touch, I referred the pages to a lady who has favored me with her views on matters with which I cannot claim any special acquaintance. Her fancy was particularly taken by the "Yankee Girl Dish Washer" made by the Davol Rubber Co., Providence. I was informed that most improved kitchen appliances come to England from America, where servants are more scarce and independent than they are here. Here perhaps I ought to use the past tense, because the servant question is becoming increasingly acute in England, with the result that ladies who have not hitherto been accustomed to work in the kitchen are now often driven to do so. The main objection to this seems to lie in getting grease on the hands in the humble task of "washing up"; hence the interest in any development which tends to obviate this.

Apropos of this topic I may say that our iron-mongers' shops are now selling rubber gloves to ladies for the purpose of washing drawingroom china, etc. These gloves are made either of pure vulcanized rubber or of white compounded rubber. Each pair is put up in a red card-board box containing instructions to avoid getting grease on them. Each glove is stamped "Made in U. S. A.," the label on the box reading, "Peerless gloves seamless." I hear that these gloves are having a good sale, though they would be more popular still if it were not for the grease embargo. Proceeding now to another matter of novelty, the baby's bath tub arrangement of the Heaton Manufacturing Co., Chicago, is reported to me as being an excellent idea, and as likely to fill a want that has long been felt.

THE RAW RUBBER SITUATION.

The fall in the price of rubber and its maintenance at a comparatively low level is not unnaturally a source of disquietude to plantation shareholders, whose fears the chairmen at various annual meetings of Eastern companies have sought to assuage by explaining the why and wherefore of the fall in price. The various statements made on this head are by no means in strict agreement, and it would be more desirable to have an authoritative pronouncement from some manufacturer of standing. There is no doubt that too much stress has been laid upon the strikes at Akron, and too little upon the large increase in supplies of plantation rubber. One manufacturer here says the simple explanation is that there is so much rubber about, and it is no question of buyers holding aloof as this is now the busy season in the motor tire trade and rubber must be had.

According to a leading article in a prominent financial paper the manufacturers are not doing well, and this accounts for a decreased demand. This statement was described by one of our leading manufacturers to whom I submitted it as all nonsense. The manufacturers, he said, are doing very well, a statement which he qualified by adding—"at least all those who know their

business are." One certainly hears that certain firms are not as busy as they have been; but taking things all around, in the light of the continuance of the trade boom, it cannot be said that any falling off in the demand for rubber is to be expected. No one expects the price to fall below 3*s.* per pound during the present year, though 2/6 is freely mentioned for next year. Of course we are told that with a fall in price to that level new uses for rubber will arise; well, they may, but this cannot be expected all at once, and it must not be overlooked that among the various other components of the goods destined for new uses there may be rises in price sufficient to discount the advantage of cheap rubber. As far as the investing public is concerned the rubber boom is quite dead, and its immediate successor—oil—is in much the same state.

The next boom is likely to be coconuts, now that the demand for coconut oil as a basis of margarine has outgrown the supply. I know something of what is going on and expect to see the public scrambling for coconut company shares in the near future. Those rubber companies, therefore, whose properties contain coconut trees, can look upon the future with more complacency than those which depend entirely upon rubber to come to fruition during the next two years.

NEW FLOTATIONS.

Under the title of Stelastic Tyres, Limited, a company was formed in April with a capital of £200,000 in £1 shares, to take over the interests of the Torkington tire. The prospectus was issued to the public, with what rejoinder I have not yet heard. Among the various agreements ratified in accordance with the Companies Acts is one between Torkington Tyres, Limited, the vendor syndicate, and Chas. Macintosh & Co., Limited. This tire has been on show at the principal motor exhibitions of late, and its tests on the road appear to have quite fulfilled expectations. The issue has been favorably received by the press, one of the leading papers, which has a reputation for criticism, describing it as fair industrial investment. In contradistinction to the Wood-Milne tire which has its tread compounded with finely powdered steel the Torkington employs a network of steel fibres.

On May 1 was issued the prospectus of the Associated Rubber Manufacturers, Limited, a company formed with a capital of £100,000 to take over the business of Almagam, Limited, which concern was formed three years ago to work the Harpenden mills associated with the new Motor & General Rubber Co., and the Warwick tire. The new company is to manufacture general rubber goods, as well as to carry on the retreading of tires with Almagam (whatever that may be). This part of the business seems to have made great strides and to be now of considerable importance; a fact which those interested in taking advertisements can point to as an object lesson for hesitating advertisers. Four out of the five directors of the new company were directors of the old one and the flotation generally seems to be practically an appeal for further capital under change of name.

COMMERCIAL MOTOR VEHICLE EXHIBITION IN LONDON.

Interest in the United Kingdom as to commercial motor vehicles has been developed to such an extent that a special exhibition devoted to that branch will be held at Olympia, London, from July 15 to 30. Its title will be "The Heavy Motor Vehicle Show."

RUBBER CLUB PROPOSED FOR LONDON.

THE idea of a rubber club for London has been ventilated. It has been suggested that those interested in rubber, coffee or copra should be eligible, while planters at home for a holiday would enjoy the privileges of the institution.

VISITS OF COMMERCIAL EXPERTS TO GERMAN INDUSTRIAL CENTERS.

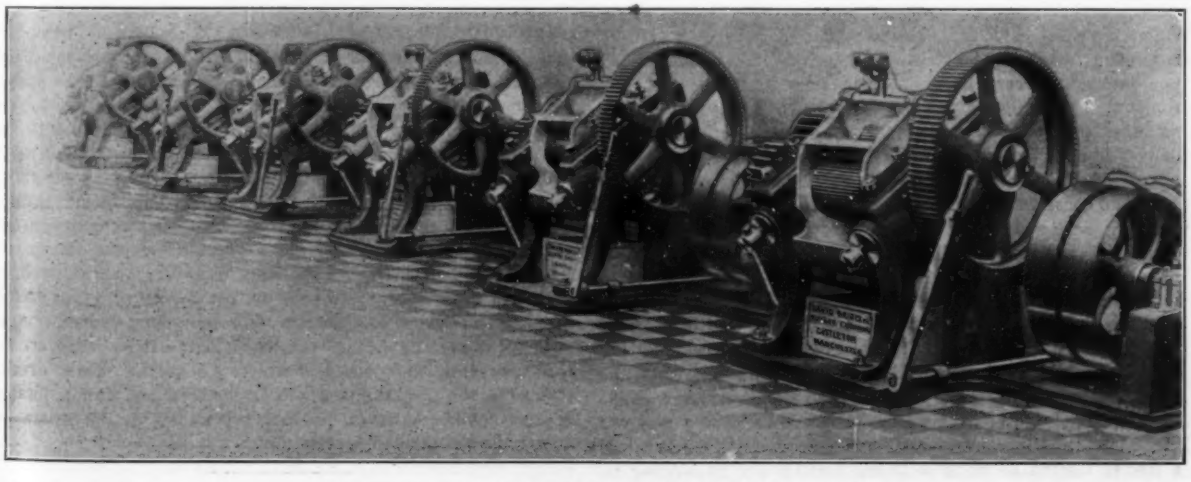
AN important feature of German export development consists of the periodical visits to German industrial centers of the commercial experts belonging to the Imperial Consulates in foreign countries.

Herr de Haas, who is attached to the Consulate General, Sydney, is now visiting the principal centers of the national industries, commencing at Breslau, May 2, and terminating at Magdeburg, June 30. During his tour he will visit thirty important cities, where he will be accessible to manufacturers at the local Chambers of Commerce.

ENGLISH OPINION OF THE PROPOSED NEW TARIFF.

In discussing the proposed new American tariff, the "India Rubber Journal" remarks that on the face of it, British manufacturers stand to gain a good deal from this reduction if carried out. But, it is added, whether the material reduction in the tariff now proposed will really enable British manufacturers to re-enter the American market is uncertain.

Scottish manufacturers are considered likely to make special efforts to profit by such reduction as may eventually be made in the duties on rubber goods.



BATTERY OF "ANGLE" BELT-DRIVEN WASHING MACHINES.
Made by David Bridge & Co., Limited, Castleton, Manchester, England.

NOTES FROM BRITISH GUIANA.

(By our Regular Correspondent.)

ALTHOUGH the actual production of rubber is still conducted only on a small scale in British Guiana, the planting of Pará rubber trees is going on steadily. The latest report by the Colonial Office shows that over eighteen hundred acres are now under cultivation in the colony. Trees planted as recently as 1907-8 and 1908-9 are now being tapped, and the results are said to be satisfactory as regards yield and quality. Good progress is being made on the Hills Estate at Bartica in the Massaruni district. Felling of trees, underbushing, planting of rubber and sisal hemp are being continued. The growth of the rubber trees is vigorous, and tapping will commence in a week or two.

The balata industry in the colony is in a much more healthy state than it has been for some time past. Whereas in the first four months of last year only 25,557 pounds of balata were exported, in the corresponding period of this year 221,652 pounds have been shipped, and week by week the exports continue to show increased growth. Last year's small figures were accounted for by the serious drought through which the colony was then passing. This year the rains have been plentiful in most districts, and bleeding is a success. From one or two of the outlying localities, however, come reports of dry weather, numbers of laborers having returned from grants in the Corentyne district, stating that owing to a shortage of rainfall it had been found impossible to bleed the bullet trees.

At the present time it is illegal to recruit laborers in British Guiana for work in a neighboring colony, and those engaged in the collection of balata in Surinam (Dutch Guiana) have been agitating for some time past to bring about a change in the conditions. It is a well recognized fact that without the laborers from British Guiana it will be impossible to work balata concessions in Surinam, and in the past it has been a somewhat difficult task to successfully secure the men from British Guiana without in a measure infringing the laws of the colony. Now, however, there is a ray of hope for those engaged in the industry in Surinam, by the fact that in a recent minute to the British Guiana legislature, the Governor, Sir Walter Egerton, advocated the passing of a law which will make it legal to contract laborers in this colony for work in the neighboring Dutch territory, after the contractor has satisfied the government of his *bona fide* intentions, and ability to comply with certain conditions which are to be embodied in the law.

It is understood that the Dutch balata companies would be willing to accept any reasonable conditions. In the course of an article on this subject, the "Paramaribo Times" says: "Sir Walter Egerton evidently holds a different opinion from his predecessor, who would not listen to such a proposition, and is unquestionably a very keen observer, and no doubt has been prompted in his action by the enormous amount of money orders and other money sent over yearly from Dutch Guiama by the laborers to their families on the British side. It is a well known and accepted fact that the majority of the houses built on the Corentyne coast were built with the money that the men worked for in Nickerie, and now that they propose to build a railway from New Amsterdam to Springlands it will mean a great deal more trade and closer connection between the British shore and the thriving and prosperous town of Nickerie.

"If this law is passed, as we have no doubt it will be, a great change will take place, which cannot but prove a boon to the balata companies, as the curse of the whole balata business is the absconding of the laborers, who as soon as they receive their advances simply cross over to the British shore where they are safe, while with this prospective law, the contracts entered into in British Guiana to work in Dutch Guiana will be binding on both colonies, and they could be held in either colony. Hence the absconding disease would be completely eradicated. British Guiana has always got one hundred times more out of her relations with us than we with her. For instance, Nickerie is not only populated with people from the British shore who get the majority of their supplies from Demerara, but is an English-speaking community, and it is therefore gratifying to see that at last they are willing to do something to give us a little protection. We know that in the past that powerful body known in British Guiana as "the Water Street Merchant" have objected to such a law, but we think that if they will investigate conditions carefully they will find that it will be materially to their advantage. The laborers only come over to Nickerie during the season and take their money over to spend it on their families on the British side."

The same paper finds fault with the government of the Dutch Colony, which it is felt ought to devise some economical plan to increase the labor population by means of land grants, etc.

There is a feeling among a number of those in British Guiana interested in the balata industry, in favor of the abolition of the existing law which prohibits the felling of the bullet trees. In Venezuela the felling method of collecting the milk is invariably practised. This method, though at first used in British Guiana, is now against the law here, as it also is in Dutch Guiana, and the method of allowing the trees to stand is now adopted in both these colonies, certain restrictions being placed upon bleeders with the object of safeguarding the life of the tree. In the opinion of the majority of balata experts here the felling method is a very wasteful one, as the forests are thereby denuded of valuable trees. As a contributor to the journal of the Royal Society says, "there are no reliable data available as to the yields obtained on the successive tappings made after the tree has first been bled, the class of men employed as bleeders and the condition under which the work is carried on being such as to render it difficult, if not impossible, to obtain such data. Yet the indisputable fact remains that tracts of Crown lands on which the balata trees were first tapped a quarter of a century ago are still being worked and continue to yield supplies of balata.

"Beside the balata trees there are other trees in the forests of British Guiana which produce latex in appreciable quantities. The most important of these is the 'Swamp Mabua' or 'Mabwa' of the Arawaks, also known to the Cari Indians as the 'Touchpong.' This species yields a rubber of good quality which has been exported for many years. It is usually classed on the market as 'Orinoco Scrap' and frequently brings good prices. Specimen biscuits of it prepared for the rubber exhibition held in London in 1908 were exhibited there."

The balata industry of the colony has lost one of its most prominent members by the recent death of the Hon. George Garnett, C. M. G., head of the firm of Garnett & Company, Limited, a firm which for many years has carried on a variety of business. Mr. Garnett was one of the pioneers of the balata industry here. He joined the firm in the early eighties, and shortly after his advent he and his partners launched into the balata industry, with which the firm has been connected for many years. A start was made in the collection of balata some thirty odd years ago in Nickerie, Dutch Guiana. Subsequently grants were obtained in Berbice, after which the firm's activities in this direction were pursued in the Cuyuni, Essequibo, Demerara river, and other districts. In Nickerie a very flourishing business was done at first, two sloops being regularly engaged in running there from Georgetown with provisions and other supplies for those engaged in the work. Ultimately, however, the Dutch government imposed enormous obligations, which greatly hampered the business, and eventually rendered it unprofitable. In this colony, however, the firm's activities in the balata industry have continued successfully.

Replete with information for rubber manufacturers: Mr. Pearson's "Crude Rubber and Compounding Ingredients."

Some Rubber Planting Notes.

HINTS TO RUBBER PLANTERS.

ONE of the features of the new "International Rubber Review," edited by M. G. van den Kerckhove, of Brussels, is the personal manner in which he addresses his readers, condensing into a few sentences the pith of the information he wishes to communicate. In regard to the relative merits of chemical coagulation and smoking he addresses his "Friends *Hevea* Planters," reminding them of his previous recommendation of coagulation by smoking, even if this should involve discarding an existing installation intended for the use of chemicals. He further urges that this step is necessary to insure plantation rubber maintaining its price with its prospective increased production in 1916-17.

In addressing his "Friends, the Castilloa Planters," he comments on the fact that the special composition of the Castilloa bark does not permit of working with an ordinary knife. For this tree the first requirement is for the tool to be as sharp as a razor, so as to properly cut the bark without crushing it.

Finally, in speaking to his "African Friends," M. van den Kerckhove dissuades them against the methodical growing of *Funtumia*, that tree not withstanding regular tappings, and not being capable of giving continuous yields.

GOVERNMENT PLANTATIONS IN THE FEDERATED MALAY STATES.

In addition to the experimental gardens at Kuala Lumpur, the government of the Federated Malay States now has the Castleton estate at Teluk Anson. It recently acquired possession of the Tanjong Pondok plantation, at Bagan Serai, in the north of Perak, containing 200 acres planted with 12 year old *Hevea* trees. Other experimental gardens belonging to the government include that of Kuala Tembeling, in Pahang, as well as Batu Tiga and Gunong Angsi. According to some opinions the results obtained by these experimental plantations are not regarded as sufficiently important.

COLLEGE OF TROPICAL AGRICULTURE FOR MALAYA.

ALTHOUGH the question of the systematic study of tropical agriculture has for some time been under consideration in Malaya, the proposal now under discussion is of far wider scope than anything before suggested. It is no less than the question of establishing a College of Tropical Agriculture, with an efficient staff and equipped with the necessary apparatus. In dealing with this subject, the "Malay Mail" refers to the advantages Japan has derived from institutions of this character. The cooperation of the District Planting Associations is suggested as one of the means likely to strengthen the hands of the government of the Federated Malay States in its efforts to promote agricultural education.

RUBBER PROSPECTS IN MALACCA.

DURING his recent visit to Ceylon the Hon. F. W. Collins, estate manager of the Malacca Rubber Plantations, Ltd., gave some interesting particulars as to Malacca in the course of an interview with a representative of the "Times of Ceylon." He stated that his company owns 24,000 acres and has about 80 Europeans employed on the property. The other laborers are Chinese and Javanese, the former proving careful and economical tappers and capable of doing a harder day's work than the Tamils.

The rubber, he reported, is doing excellently, disease being practically non-existent. Malacca, he added, is rapidly coming to the front as a rubber producing country. While the trees take longer to come into bearing than those of the Federated Malay States, the yield, once tapping has started, is well up to the general average. The whole of the Malacca properties are in a high state of cultivation, being thoroughly clean weeded. The limit of planting in Malacca is 20 x 20, diagonally, or 100 trees to the acre, which is proving exceedingly satisfactory.

It is of interest to note the favorable report of Mr. Collins on Chinese labor, in connection with the recommendations of the Akers Commission as to its adoption in Brazil.

NINE MONTHS' STATISTICS OF PLANTATION RUBBER.

DURING the nine months ending March 31 last, the London receipts of plantation rubber amounted to 19,700 tons, and the deliveries to 18,300 tons, compared with receipts of 10,600 tons and deliveries 9,500 tons for the corresponding period a year earlier. Stock of plantation rubber on March 31, this year, was about 2,800 tons, as against 1,850 tons in 1912, and 770 tons in 1911. From the above figures it will be noticed that the receipts and deliveries have both nearly doubled in the period ending March, 1913, as compared with the figures of a year earlier.

SOME RUBBER NOTES FROM PARA.

By a Special Correspondent.

MR. AKERS has arrived in Pará, and the Booths, accompanied by practical instructors in tapping, have also come from Europe to join him on his trip up the Madeira. He gave a practical demonstration of tapping at the Botanic Gardens at Rio, in the presence of the President of the Republic, assisted by Dr. Willis. But Dr. Willis seems cautious about saying that this system should be adopted in the case of old trees, whilst Mr. Akers' report suggests that the old system should be prohibited and the herring bone alone permitted. Another demonstration took place in Pará, the public invitation being given by M. J. Guerin, of the Port of Pará Port Works.

Dr. Huber has been working for several years on an instrument for tapping, which he claims will be "fool proof" and absolutely true to 1/128 of an inch in its setting. This is a handy tool, and any workman might be induced to use it; but the use of the gouge which Mr. Akers means to put into the hands of the *Seringueiro* is resented off-hand—and unless one can get such ignorant men to use a new implement with pleasure and good will there will never be a change in the methods of tapping.

Attempts are also being made to get the government to introduce 50,000 Chinese immigrants and take off all duties on both exports and imports of first necessaries of life, implements, etc. I believe popular sentiment is being aroused to the pitch that the government must yield to this elimination of duties, but I doubt whether it will concur in the introduction of Chinese. I also believe that the Chinese will come of their own accord as soon as the Panama Canal is opened and communications between the east of Asia and north of Brazil become established.

It is now seen that it was suicidal not to have begun to plant six or seven years ago, to meet the East Indian competition on equal grounds. But, nevertheless, not a single practical step has yet been taken to carry this out. A mass meeting was held at the Chamber of Commerce, to telegraph to the Federal government to adopt measures of relief for the industries in the Amazons, but nothing will be done beyond what has been projected through the "Defesa de Borracha," and this is doing its best to show its utility—but things cannot be done as hastily as people wish.

The fall of rubber to 3*s.* 4*d.* and the keeping of this price for some time longer will be fatal to the industry in the Amazons, unless the duties are removed. Whether these can be removed without violating the Constitution is a question open to debate. But if the interests of the nation exact this violation it should be done in the most open and frank manner.

Recent Patents Relating to Rubber.

UNITED STATES OF AMERICA.

ISSUED APRIL 1, 1913.

NO. 1,057,398. Vehicle tire. G. C. Allison, Louisville, Ohio.
1,057,439. Tire patching device. G. J. Martel, Chicago, Ill.
1,057,440. Tire patching device. G. J. Martel, Chicago, Ill.
1,057,451. Tire filling machine. E. Oliver, Daytona, Fla.
1,057,467. Vehicle tire. C. S. Turner, assignor to The Firestone Tire & Rubber Co.—both of Akron, Ohio.
1,057,486. Milking device. T. Kupper, Madison, Wis.
1,057,562. Pneumatic cushion for stump legs. J. G. La Point, New Albany, Ind.
1,057,580. Tire. E. C. Rhodes, Chicago, Ill.
1,057,672. Automobile tire. J. Ruppert, Jr., and Ernest Siegel, New York.
1,057,676. Pneumatic tire. George A. Shaw, Barberton, Ohio.
1,057,680. Production of isoprene. K. Stephan, Charlottenburg, assignor to Chemische Fabrik auf Actien (vorm. E. Schering), Berlin, Germany.
1,057,746. Emergency tire. F. W. Kremer, Carlstadt, N. J.
1,057,846. Automatic pneumatic vehicle wheel. G. Kanter, Murton, Victoria, Australia.
1,057,848. Boxing glove. D. J. Kennedy, Yonkers, N. Y.
1,057,911. Portable vulcanizing device for tires. C. F. Adamson, Akron, Ohio.
1,057,946. Puncture proof tire. C. De Hibbs, Fort Worth, Tex.
1,057,959. Vacuum pump. W. A. Hearn, Baltimore, Md.
1,058,005. Wheel for motor and other vehicles. R. W. Sewell, assignor to Sewell Cushion Wheel Co., Brooklyn, N. Y.
1,058,006. Vehicle wheel. O. K. Sletto and W. J. Shannon, Bend, Ore.

Trade Marks.

44,456. The Beacon Falls Rubber Shoe Co., Beacon Falls, Conn. Maltese cross emblem. Boots, shoes, arctics, etc.
65,402. "Flexitallic" Gasket Co., Camden, N. J. The word *"Flexitallic."* Gaskets and packings.
66,593. Continental-Caoutchouc-und Gutta-Percha-Compagnie, Hanover, Germany. Picture of man's arm holding tire in air.
68,722. Hood Rubber Co., Boston, Mass. The word *Holiday.* For boots, shoes, etc.

ISSUED APRIL 8, 1913.

1,058,029. Tire protector. M. D. Besse, Dayton, Ohio.
1,058,030. Resilient tire for vehicle wheels. W. S. Brooks, Akron, Ohio.
1,058,151. Resilient tire. John H. Cebolt, Indianapolis, Ind.
1,058,173. Massage instrument. H. A. Grass, Chicago, Ill.
1,058,186. Art of refining rubber. W. A. Lawrence, New York, assignor to Intercontinental Rubber Co., Jersey City, N. J.
1,058,189. Attachment for hose nozzles. J. McBoyle, Oakland, Cal.
1,058,273. Massage device. C. E. Thompson, assignor to Luxury Sales Co.—both of Troy, N. Y.
1,058,316. Portable vulcanizer. C. E. Marshall, Indianapolis, Ind.
1,058,358. Side wire tire. H. S. Firestone, assignor to The Firestone Tire & Rubber Co.—both of Akron, Ohio.
1,058,399. Demountable rim. R. W. Ashley and F. Oberkirch, assignors to General Rim Co.—both of New York.
1,058,400. Demountable rim. R. W. Ashley and F. Oberkirch, assignors to General Rim Co.—both of New York.
1,058,433. Pneumatic tire. F. B. Huckstep, Des Moines, Iowa.
1,058,517. Spring wheel. F. H. Allen, McNabb, Ill.
1,058,518. Vehicle wheel. L. Anderson, Lake Creek, Tex.
1,058,527. Appliance for securing ladies' veils. A. Barnett, London, England.
1,058,528. Device for securing ladies' veils in position. A. Barnett, London, England.
1,058,538. Hose rack. W. Boss, St. Paul, Minn.
1,058,557. Tire deflating tool. M. L. Connor, Pony, Mont.
1,058,559. Cushion tire. G. H. Dalton, Chester, Pa.
1,058,560. Fountain comb. L. H. Dancy, Holly Springs, Miss.
1,058,571. Automobile tube and tire signal. J. E. Featherston, Valley City, N. D.
1,058,593. Spring tire. A. Jenness, Boundbrook, N. J.
1,058,619. Tire rim tool. A. L. McMurtry, Sound Beach, Conn.
1,058,683. Rubber packed coupling for lock bar pipe. G. P. Boothe, assignor to S. R. Dresser Mfg. Co.—both of Bradford, Pa.

Trade Marks.

68,222. Vulcan Asbestos Mfg. Co., New York. The word *"Vaco."* Fibrous rod packing, cotton rod packing, rubber rod packing, etc.
68,653. Hood Rubber Co., Boston, Mass. Picture of part of shoe. Rubber boots and shoes, etc.

ISSUED APRIL 15, 1913.

1,058,749. Hollow work support for leather working machines. H. A. Holder, Lynn, Mass., assignor to Holder-Perkins Co., Woburn, Mass.
1,058,848. Pavement and process of making same. Arthur B. Cowdery, Boston, Mass., assignor to Barrett Mfg. Co., New York.
1,058,857. Rubber heel lift. A. A. Glidden, Watertown, assignor to Hood Rubber Co.—both of Massachusetts.
1,058,937. Chemical fire extinguisher. E. C. Barron, West Kensington, London, England.
1,058,961. Bicycle pump. E. N. Garrison, assignor to The Coe-Stapley Mfg. Co.—both of Bridgeport, Conn.
1,058,973. Non-refillable bottle. J. Herboldt, Woodside, Idaho.
1,058,998. Wheel. M. B. Okun, Seattle, Wash.
1,059,009. Wheel. J. E. Strietelmeier, assignor to the Ideal Wheel Co.—both of Cincinnati, Ohio.
1,059,026. Vehicle wheel. G. D. Bulmer, Duquesne, Pa.
1,059,100. Clasp for hose racks. W. D. Allen, assignor to W. D. Allen Mfg. Co.—both of Chicago, Ill.
1,059,115. Punctureless vehicle tire. P. H. Calmus, Birmingham, Ala.
1,059,122. Cushion tire for vehicles. J. Dana. Burwell, Neb.
1,059,128. Tire tool. C. S. Edwards, Prineville, Ore.
1,059,182. Tire chain. D. J. Martin, New York.
1,059,183. Tire chain. D. J. Martin, New York.
1,059,194. Vehicle wheel. B. B. Moss, Salem, Ind.
1,059,207. Pneumatic tire and armor therefor. J. A. Posey, Waxahachie, Texas.
1,059,215. Swimming suit. S. Roth, New York.
1,059,222. Air pump. C. M. Scott, San Angelo, Texas.
1,059,282. Comb. V. de Bassini, New York.
1,059,291. Garment stay. S. H. Fleming, Chicago, Ill.

Design.

43,849. Bathing cap. J. R. Parker, New York.

Trade Marks.

66,200. Sagamore Rubber Mfg. Co., Saugus, Mass. Illustration of bowling ball. Bowling balls.
67,011. Ste. Ame. Pour Le Commerce & L'Industrie du Caoutchouc, Brussels, Belgium. Tiger's head in circle over the word *Royal.* Rubber atomizer and syringe bulbs.
68,000. The Seamless Rubber Co., New Haven, Conn. Illustraton of fleur de lis. All kinds of druggists' sundries.
68,376. Sears, Roebuck & Co., Chicago, Ill. The word *Justice.* For rubber tires.

ISSUED APRIL 22, 1913.

1,059,344. Pneumatic tire. J. F. Casteran, St. Georges les Bains, Charmes, France.
1,059,382. Clamping device for demountable vehicle rims. F. H. Moyer, assignor to The Firestone Tire & Rubber Co.—both of Akron, Ohio.
1,059,392. Life preserver. J. J. Puskanen, Chisholm, Minn.
1,059,401. Vehicle wheel. C. Sjogren, Wessington Springs, S. D.
1,059,437. Resilient tire for vehicles. J. T. Clark, Provo, Utah.
1,059,442. Life preserver. A. Cseki, Cleveland, Ohio.
1,059,444. Life preserver. A. Cseki, Cleveland, Ohio.
1,059,455. Massaging implement. R. W. Griffith, Milwaukee, Wis.
1,059,543. Boot and shoe. S. L. Kelley, Grand Junction, Colo.
1,059,575. Vehicle wheel rim. E. C. Shaw, assignor to The United Rim Co.—both of Akron, Ohio.
1,059,587. Vulcanizer. B. M. Allen, Des Moines, assignor to Diamond Mfg. Co., Polk County, Iowa.
1,059,603. Trousers supporter. A. R. Fritz, Waverly, Iowa.
1,059,612. Weather strip. J. Kammerer, New York.
1,059,616. Spring wheel. F. Klitchko, Cleveland, Ohio.
1,059,627. Surgical blanket. A. R. McClimans, Burwell, Neb.
1,059,736. Gun for killing flies and other insects. T. H. Kilduff, Brookline, Mass.
1,059,753. Hose nozzle. W. O'Brien and F. W. Waddell, Pittsburgh, Pa.
1,059,765. Demountable rim for vehicle wheels. J. Rosenbaum, Mount Vernon, Ind.
1,059,773. Filter. J. Sgambati, New York.
1,059,811. Dress shield pocket. M. Barrow, New York.
1,059,843. Tire. M. Dawson, Vancouver, B. C., Canada.
1,059,869. Elastic for children's socks. E. M. Hatfield, New York.
1,059,870. Tire clamping device. C. Helreigel, Pittston, Pa.
1,059,882. Spring wheel. H. W. Lang, Litchfield, Neb.
1,059,903. Insulator with fuse. K. Pettersen, Sarpsborg, Norway.
1,059,911. Blouse retainer and skirt supporter. S. E. Rutter, Camberwell, assignor to W. G. Harris—both of London, England.
1,059,961. Garter fastener. W. Frieder, Cincinnati, Ohio.

Designs.

43,892. Vacuum massage device. F. O. Parker, Washington, D. C.
43,894. Shower head. A. C. Recker, Oakville, assignor to Waterbury Mfg. Co., Waterbury—both of Connecticut.
43,895. Hot water bottle. A. C. Recker, Oakville, Conn., assignor to Waterbury Mfg. Co., Waterbury, Conn.

Trade Marks.

54,977. Century Rubber Trading Co., Plainfield, N. J. Illustration of eagle in circle. Tires.
59,278. Elchemco Mfg. Co., Jersey City, N. J. The word *Elchemco.* Metallic rubber covered floorings and stair treads.
64,155. The Diamond Rubber Co., assignor to The B. F. Goodrich Co.—both of Akron, Ohio. The word *Oriole.* Bicycle tires, rubber tubes, etc.
64,156. The Diamond Rubber Co., assignor to The B. F. Goodrich Co.—both of Akron, Ohio. The word *Highland.* Bicycle tubes, tires, etc.
68,442. National Wood Reproducing Co., Augusta, Me. The word *Natwood.* Waterproof floor covering.
68,807. Transportation Utilities Co., New York. The word *Tuco.* Fabric belting.

ISSUED APRIL 29, 1913.

1,060,080. Vehicle tire. T. L. Gunning, Chicago, Ill.
1,060,195. Tire. A. W. Livingston, assignor to Standard Steel Wheel & Tire Armor Co.—both of Oakland, Cal.
1,060,237. Bottle stopper. J. Duan, Waltersburg, Pa.
1,060,262. Core for building pneumatic tires. N. D. Kuhlke, Akron, Ohio.
1,060,301. Vehicle tire. E. Williamson, Chicago, Ill.
1,060,339. Tire shrinking machine. S. N. House, St. Louis, Mo.
1,060,480. Resilient wheel. G. D. Minnick, Riverton, Neb.

Trade Marks.

68,849. R. F. MacClemmy, New Haven, Conn. A diagonal strip. Body braces.
68,901. R. F. MacClemmy, New Haven, Conn. Illustration of a crown. Body braces.
68,998. The B. F. Goodrich Co., New York, and Akron, Ohio. The word *Pinnacle.* Flush valves of rubber.

GREAT BRITAIN AND IRELAND.

PATENT SPECIFICATIONS PUBLISHED.

The number given is that assigned to the Patent at the filing of the application, which in the case of these listed below was in 1911 and 1912.
**Denotes Patents for American Inventions.*

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 2, 1913.]

27,617 (1911). Receptacles for mucilage, etc. J. Nitzgen, 17 Martinstrasse, Cologne, Germany.

27,659 (1911). Coverings for ships. R. McIvor & Sons, and W. T. McIvor, 309 Cleveland street, Birkenhead.

27,664 (1911). Preparation of india-rubber. F. A. Byrne, Ludgate Hill, Birmingham.

27,665 (1911). Preparation of india-rubber. F. A. Byrne, Ludgate Hill, Birmingham.

27,666 (1911). Preparation of india-rubber. F. A. Byrne, Ludgate Hill, Birmingham.

27,680 (1911). Band of balata for portable track wheels. F. Kilcher, 309 Hampstrasse, Birsfelden, Baselland, Switzerland.

27,683 (1911). Cores for paper rolls. H. Roscher, 107 Oberbilker Alee, Dusseldorf, Germany.

27,695 (1911). Jackets and covers for wheel tires. R. Latour, 157 Chaussee d'Ypres, Menin, Belgium.

27,759 (1911). Electric insulator. W. McLoughlin, 154 Anglesey street, Loxells, Birmingham.

27,802 (1911). Preparation of artificial rubber. G. Reynaud, 5 Rue Salneuve, Paris.

27,827 (1911). Tire attachments to rims. E. W. Harriott, High street, Droxford, Hampshire.

27,835 (1911). Cellulose solutions. E. de Haen, Chemische Fabrik "List," Seelze, near Hanover, Germany.

27,839 (1911). Ear protectors. A. Mallock, 3 Victoria street, Westminster.

27,870 (1911). Tool for removal and replacement of tires. C. S. Challiner, 18 Park Range, and J. A. Challiner, "The Glen," Anson Road—both in Victoria Park, Manchester.

27,903 (1911). Tire attachments to rims. L. A. L'Huillier, 52 The Grove, Hammersmith, London.

27,907 (1911). Construction of aerial planes. E. C. R. Marks, 57 Lincoln's Inn Fields, London.

27,933 (1911). Shield for filling hot water bottle. T. Rowe, 52 Harold Road, Leytonstone, London.

27,957 (1911). Detachable rim attachments to wheels. B. B. Roberts, Park House, Cimla, Neath, Glamorgan.

28,029 (1911). Massage appliance. H. Dreuw, 110 Koniggratzerstrasse, Berlin.

28,031 (1911). Rubber lining for deadening railway sounds. C. J. Evans, 108 Castelnau, Barnes, London.

28,035 (1911). Not-return valve for feeding bottle. A. T. Maw and R. J. Shannon, 7 Aldersgate street, London.

28,059 (1911). Tread bands, projections, etc. J. F. F. W. Ure, 12 Sloane Court, Chelsea, London.

28,109 (1911). Jackets and covers for tires. G. A. Mortier, Elsinore, Garstang Road, and C. Macbeth, 142 Watling street Road—both in Fullwood, Preston, Lancashire.

28,149 (1911). Tread bands. B. E. D. Kilburn, Chancery Lane Station Chambers, London.

28,163 (1911). Rubber soles for shoes. G. F. Forwood, West Chart, Limpsfield, Surrey.

*28,182 (1911). Tool for removing and replacing tires. J. H. Blake, 368 Front street South, Portland, Oregon, U. S. A.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 9, 1913.

28,256 (1911). Pocket atomizer. G. Blochet, 3 Rue des Grands, Augustins, Paris.

28,208 (1911). Outer ring for spring wheels. J. I. Duchateau, 29 Rue Gambetta, St. Omer, Pas-de-Calais, France.

*28,256 (1911). Outer ring for spring wheels. T. H. Grigg, 3838 Baring street, Philadelphia, Pa., U. S. A.

28,268 (1911). Key for removing crown stoppers. A. F. Sargeaunt, Chenies street, Tottenham, Court Road, London.

28,308 (1911). Pump for inflating tires. C. W. Tanner, High street, Laycock, near Chippenham, Wiltshire.

28,325 (1911). Waist belt. A. P. Jones, Hilbre avenue, Tue Brook, Liverpool, and A. Rae, 4 Sunbury Road, Seacombe, Cheshire.

*28,376 (1911). Outer ring for spring wheels. A. C. Backus, 717 E. 182nd street, Bronx, N. Y., U. S. A.

28,378 (1911). Tire vulcanizers. E. C. R. Marks, 57 Lincoln's Inn Fields, London.

*28,380 (1911). Fire extinguishing apparatus. D. W. Adams, Glendale Springs, North Carolina, U. S. A.

28,466 (1911). Suspenders for hats. W. Bereths, Hardt, near Munich-Gladbach, Germany.

28,536 (1911). Rubber as compounding ingredient of cement. G. A. A. Ceulaers, 186 Rue du Moulin, Brussels.

28,554 (1911). Skirt and blouse adjusters. J. A. Roth, "Knollys," Toxtoth Road, Glebe Point, near Sydney, Australia.

28,761 (1911). Door mats, stair treads, etc. G. Cummings, Bleak House, Gosforth, Northumberland.

28,781 (1911). Treating india-rubber. R. Bridge, Castleton, near Rochdale, Lancashire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 16, 1913.]

17,648 (1911). Preparation of zinc oxide. F. C. Beauchamp, 9 Park Hall Parade, East Finchley, London.

28,871 (1911). Impregnated cords for packing. J. A. Dick, 51 Fenchurch street, London.

28,885 (1911). Tire attachments to rims. J. Ashton, Kilnahue Rectory, Gorey, Ireland.

28,905 (1911). Detachable rim attachments to wheels. A. Turnbull, St. Mungo Works, Bishopbriggs, Glasgow.

28,915 (1911). Tire attachments to rims. A. E. Lucas, C. H. May and W. Armstrong, 39 William street, Birmingham.

28,931 (1911). Non-metallic tire. J. Guerrero, 7 Rue Georges-Ville, Paris.

28,951 (1911). Rubber ball for anesthetic mask. K. A. E. Fries, 16 Scheelegatan, Stockholm.

29,001 (1911). Non-metallic tire. J. Guerrero, 7 Rue Georges-Ville, Paris.

29,008 (1911). Rubber masticating machine. J. E. Pointon, Westwood Works, Peterborough.

29,010 (1911). Detachable rim attachments to wheels. P. B. Bosworth, 48 Great Russell street, Holborn, London, and A. C. Tyre Co., Union street, Sunderland.

29,048 (1911). Rubber washer for siphon bottles. J. F. Marshall, 50 Wigmore street, London, and T. F. Garrett, 64 Kimberley avenue, Seven Kings, Essex.

29,057 (1911). Sheeting india-rubber. W. Coulter, 284 Hyde Road, West Gordon, Manchester, and R. Bridge, Castleton, Lancashire.

29,142 (1911). Jackets and covers for wheel tires. E. Clark, 4 Colloseum Terrace, Albany street, Regents Park, and C. N. I. Irving, Winter-13, Bruton street, Mayfair—both in London.

29,154 (1911). J. G. A. Kitchen, 7 Rose Bank, Scotforth, Lancaster, and I. H. Storey, Loughrigg Brow, Ambleside, Westmoreland.

29,213 (1911). Preparation of india-rubber. Farbenfabriken Vorm. F. Bayer & Co., 217 Koenigstrasse, Elberfeld, Germany.

29,215 (1911). Rubber for connecting pipe joints. C. Rudolph, 66 Rue du Theatre, Paris.

29,246 (1911). Jackets and covers for wheel tires. A. Margetts, 64 Cow Cross street, London.

29,265 (1911). Vulcanizer for repairing tires. C. F. Adamson, Hamilton Bldg., Akron, Ohio.

*29,274 (1911). Detachable rim attachments to wheels. W. E. Copithorn, 49 North Main street, and H. M. Ferguson, 25 Waban street—both in Natick, Massachusetts, U. S. A.

29,278 (1911). Compounds of rubber. L. C. T. Tureat, and G. E. Nuth, 44 Rue Crillon, Marseilles, France.

29,294 (1911). Motor car horns. W. P. Thompson, 6 Lord street, Liverpool.

29,296 (1911). Implement for tapping rubber trees. J. da C. Gadelha, Nova Vista, Labrea, Amazonas, Brazil.

29,360 (1911). Implement for tapping rubber trees. J. da C. Gadelha, Nova Vista, Labrea, Amazonas, Brazil.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 23, 1913.]

3 (1912). Bottle stoppers, etc. A. Nixon, 34 Deramore street, Rusholme, Manchester.

14 (1912). Non-metallic elastic tires. J. Cairns, 621 Alexander Parade, Glasgow.

27 (1912). Rubber in cycle springs. J. R. Hannam, 137 Bramall Lane, Sheffield.

47 (1912). Air tubes and chambers in pneumatic tires. S. Ramsbotham, 10 Keymer Road, Streatham Hill, London.

*75 (1912). Block tires. F. M. Henry, 222 Macdougal street, Brooklyn, N. Y.

76 (1912). Cores in vehicle wheels. G. Madden, 53 Devonshire street, Islington, London.

80 (1912). Outer ring for spring wheels. C. Beaven, 26 Bridge avenue, Hammersmith, London.

102 (1912). Silent chains. A. S. Hill, and Coventry Chain Co., Spon End, Coventry.

105 (1912). Rubber resins in chewing gum. P. M. Justice, 55 Chancery Lane, London.

139 (1912). Tread bands. M. H. Cleaver, 128 Gloucester Terrace, Hyde Park, London.

164 (1912). Mud guards for motor vehicles. C. H. Richardson, 73 Lorne Road, Forest Gate, London.

173 (1912). Method of making articles from caoutchouc. H. Dogny, 13 Avenue d'Eylau, and V. Henry, 82 Rue Claude Bernard—both in Paris.

185 (1912). Exercise appliances. H. T. and S. W. Tubbs, and F. H. Hopson, 29 Noble street, London.

207 (1912). Jackets and covers for wheel tires. T. H. Buckley, 34 Stoke Park, Coventry.

234 (1912). Air tubes and chambers of tires. L. W. Holmes, 48 Great Russell street, Holborn, London.

235 (1912). Vulcanizing tires. L. Corane, 23 Rue Jenner, Paris.

269 (1912). Closing device for boot. V. R. von Heidelberg, Meran, Tyrol, Austria.

*276 (1912). Apparatus for generating oxygen. D. E. Parker, 456 27th street, Niagara Falls, N. Y., U. S. A.

277 (1912). Method of obtaining dichlorhydrocarbons. W. H. Perkin and C. Weizmann, University, and H. Davies, 5 West Grove—both in Manchester.

293 (1912). Disk wheels. J. Sankey & Sons and W. Burton, Albert street Works, Bilston, Staffordshire.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, APRIL 30, 1913.]

339 (1912). Rubber in mats. C. E. Player, Birkenhead, Auckland, New Zealand.

408 (1912). Outer ring for spring wheels. M. Frani and P. Piano, 3 Corso Buenos Aires, Genoa, Italy.

*424 (1912). Rubber plug in crutches. H. H. Flynn, Bellevue, Washington, U. S. A.

457 (1912). Mud guards for wheels. A. J. H. Ladd, 10 Hainthorpe Road, West Norwood, London.

478 (1912). Rubber pads in jugs. H. Jewett and W. Kraft, Hans Crescent Hotel, Hans Crescent, London.

619 (1912). Non-metallic elastic tire. A. von Bruning, 17 Place des Etats Unis, Paris.

629 (1912). Non-metallic elastic tire. C. R. S. J. Halle, 17 Warwick Gardens, Kensington, London.

636 (1912). Plastic compositions. K. Scherrer, 33 Schwanthalerstrasse, Frankfort-on-Main, Germany.

654 (1912). Rubber tape for golf balls. W. T. Hill, Greenhill, Rathen Road, Withington, Manchester, and R. Milne, Arnold Avenue, Bishopbriggs, Lanarkshire.

660 (1912). Rubber in photography. G. Crane, Murdieston Farm, Greenock.

693 (1912). Tire attachments to rims. S. H. Cope and Warland Dual Rim Co., Alma street, Aston, Birmingham.

694 (1912). Process of making waterproof fabrics. J. W. H. Dew and Azulay Syndicate, 8 Laurence Poutney Hill, Cannon street, London.

695 (1912). Tread bands. J. W. H. Dew and Azulay Syndicate, 8 Laurence street, London.

715 (1912). Tread bands. J. Knight, 9a Caldy Road, Aintree, Liverpool.

737 (1912). Jackets and covers for tires. F. Rose, 1 Brunswick street, Liverpool, and A. Rae, 17 Northbrooke Road, Seacombe, Cheshire.

Report of the Crude Rubber Market.

THE course of the London market for fine Pará during the month of April was, it will be recalled, almost constantly downward, while the tendency during May has been nearly uninterruptedly in the opposite direction. From 3*s.* 10¾*d.* on March 26, it had dropped to 3*s.* 4½*d.* on April 26, having recovered on May 24, at time of writing, to 3*s.* 9*d.* The price has risen slowly but steadily, the low figure of 3*s.* 3¼*d.* reached on April 15 not having since been recorded. In the earlier days of May, buyers were following their former policy of only covering immediate requirements. At the close of the first week, speculative buying, both for European and American account, gave additional strength to the market. According to some reports this development of the market was due to the existence of a large short interest in Upriver Fine. The improved prices then established have since been maintained.

Plantation rubber, while sharing in the upward movement, has not done so to the same extent as was the case with fine Pará. On April 26 it stood at 3*s.* 2½*d.*, while Pará fine was at 3*s.* 4½*d.* By May 24 the respective quotations were 3*s.* 3*d.* and 3*s.* 9*d.*

In connection with the fact of Pará rubber being now quoted at 6*d.* per pound above plantation rubber, an opinion has been expressed in London that the Pará position is entirely artificial, the supplies having been concentrated in one quarter, and prices having been unreasonably advanced. The anticipation of the sale of 113 tons (principally Congos) announced for May 27 at Havre rendered buyers cautious during the month in their operations. It was, however, hoped that the improvement in London would affect the result of the approaching auction. At the Antwerp sale of April 22, Congo grades were neglected, only 105 tons being sold out of 506 tons offered. The prices realized showed a decline since the previous month's auction equalling 4¾*d.* per pound. Of the 178 tons plantation rubber offered, 165 tons were sold, at an average decline, equalling 7⅜*d.* per pound.

Antwerp stock at the end of April amounted to 990 tons as compared with 438 tons on April 30, 1912. The sale of May 21 at Antwerp included 200 tons of plantation rubber which sold at advanced prices, and 130 tons Congo which were disposed of at a decline. The Rotterdam sale of April 23 included about 20 tons *Hevea*, which realized 2 per cent. below valuations and 14 tons *Ficus*, which fetched 5 per cent. below rates of last sales. *Hevea* formed the largest portion of the Amsterdam sale of May 16, representing 81 tons out of 94 tons the balance consisting of *Ficus* and *Castilloa*. From Hamburg a much firmer market has been reported, important sales of South Cameroon balls having been effected.

The London auction of April 29 included 900 tons, the quantity being less than had been anticipated. Prices closed on an average 1*d.* below those of the previous fortnightly sales. Owing to the Whitsuntide holidays on May 12 and 13, an auction was held on May 6, which included 500 tons, which met with a fair demand at about the prices of the sale a week earlier. The next auction took place on May 19, including about 800 tons which realized an advance of 1*d.* to 2*d.* as compared with the sale of 6th.

Statistics, including the first series of sales in May, show a total of 8,536 tons as having been auctioned this year in London, as compared with 5,991 during the corresponding period of 1912. The London "Economist" states that the total supply now coming on the Mincing Lane market fortnight by fortnight, is, roughly speaking, what had been looked for by the end of 1914.

Statistics to the end of April show the following estimate of the visible supply of Pará and Caucho rubber:

	1912.		1913.	
Pará .....*Tons*	6,260		5,230	
Caucho	1,670	7,930	2,830	8,060

The visible supply of the above grades had decreased by 500 tons within a month, this year's total being about that of the corresponding period last year.

Business in New York has followed the course of the London market. Many of the large consumers are said to be very busy, particularly in tires, while their supplies of crude rubber are said to be moderate, yet large enough to meet their wants for the early summer.

NEW YORK QUOTATIONS.

FOLLOWING are the quotations at New York for Pará grades, one year ago, one month ago, May 29—the current dates:

PARA.	June 1, '12.	May 1, '13.	May 29, '13.
Islands, fine, new	105@106	80@ 81	84@ 85
Islands, fine, old	107@108	.....	.....
Upriver, fine, new	109@110	82@ 83	89@ 92
Upriver, fine, old	112@113	.....	.....
Islands, coarse, new	57@ 58	39@ 40	40@ 41
Islands, coarse, old	.....	.....	.....
Upriver, coarse, new	89@ 90	55@ 56	58@ 59
Upriver, coarse, old	.....	.....	.....
Cametà	65@ 66	42@ 43	42@ 43
Caucho (Peruvian) ball...	87@ 88	57@ 58	58@ 59
Caucho (Peruvian) sheet..	.....	.....	.....
PLANTATION CEYLONS.			
Fine smoked sheet	118@119	81@ 82	83@ ..
Fine pale crepe	119@120	80@ ..	80@ ..
Fine sheets and biscuits ..	114@115	80@ ..	79@ 80
CENTRALS.			
Esmeralda, sausage	82@ 83	56@ ..	58@ 59
Guayaquil, strip	.....	.....	.....
Nicaragua, scrap	80@ 81	55@ ..	55@ 56
Panama	.....	.....	.....
Mexican plantation, sheet..	.....	.....	.....
Mexican, scrap	81@ 82	55@ 56	56@ 57
Mexican, slab	.....	.....	.....
Mangabeira, sheet	.....	.....	.....
Guayule	55@ 56	.....	.....
Balata, sheet	89@ 90	.....	.....
Balata, block	55@ 56	.....	.....
AFRICAN.			
Lopori, ball, prime	.....	.....	.....
Lopori, strip, prime	.....	.....	.....
Aruwimi	.....	65@ ..	.....
Upper Congo, ball red....	107@108	75@ ..	.....
Ikelemba	.....	.....	.....
Sierra Leone, 1st quality..	94@ 95	.....	.....
Massai, red	95@ 96	74@ ..	.....
Soudan Niggers	.....	.....	.....
Cameroon, ball	66@ 67	60@ ..	.....
Benguela	.....	.....	.....
Madagascar, pinky	.....	.....	.....
Accra, flake	27@ 28	.....	.....
EAST INDIAN.			
Assam	.....	.....	.....
Pontianak	5⅝@5¾	.....	.....
Borneo	.....	.....	.....

New York

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York) advises as follows: "During May there has been only a moderate demand for commercial paper in the rubber line, principally from out-of-town banks, and rates have ruled quite firm at 5½ @5¾ per cent. for the best names, and 6@6½ per cent. for those not so well known."

NEW YORK PRICES FOR APRIL (NEW RUBBER).

	1913.	1912.	1911.
Upriver, fine	$0.78@ .89	$1.12@1.18	$1.18@1.45
Upriver, coarse	.54@ .66	.92@ .96	.88@1.10
Islands, fine	.76@ .85	1.10@1.14	1.12@1.35
Islands, coarse	.37@ .41	.63@ .66	.60@ .63
Cametá	.39@ .45	.66@ .70	.75@ .80

STATISTICS PARA INDIA RUBBER (IN TONS).

(Including Caucho.)

STATISTICS FOR THE MONTH OF APRIL.

	Pará.	Caucho.	1913. Tons.		1912. Tons.	1911. Tons.	1910. Tons.
Receipts at Pará	2,110	1,430	= 3,540	against	3,270	3,490	3,600
Shipments to Liverpool	1,190	790	= 1,980	"	1,290	1,450	2,800
Shipments to Continental Ports	180	230	= 410	"	440	270	860
Shipments to America	770	350	= 1,120	"	1,350	1,110	470
American Imports	1,120	290	= 1,410	"	2,000	1,320	320
American Deliveries	1,280	390	= 1,670	"	1,910	1,130	490
Liverpool Imports	1,185	915	= 2,100	"	1,466	1,681	3,818
Liverpool Deliveries	1,162	608	= 1,770	"	1,426	1,128	2,997
Continental Imports	440	240	= 680	"	230	170	560
Continental Deliveries	310	70	= 380	"	260	230	550

VISIBLE SUPPLY—1ST MAY, 1913.

	1913. Pará.	1913. Caucho.	1912.	1911.	1910.
Stock in England, Pará, 1st hands	1,046	.....	1,530	3,369	757
Pará, 2nd hands	127	.....		812	348
Caucho	.....	710	190	808	465
Stock in Pará, 1st hands	540	210	510	1,650	280
2nd hands	230	110	390	250	230
Syndicate	810	.....	2,240	2,810	.....
Stock in America	150	80	180	640	90
Stock on Continent	160	190	40	70	30
Afloat—Europe	850	680	1,250	1,180	2,180
Afloat—America	370	250	440	500	140
	4,283	2,230			
Total Visible Supply, including Caucho.	6,513		6,770	12,089	4,520

CROP STATISTICS—30TH JUNE, 1912, 30TH APRIL, 1913.

	Pará.	Caucho.	1912/13.	1911/12.	1910/11.	1909/10.
Pará Receipts	1912/13 29,210	7,760	36,970	33,380	32,720	35,780
	1911/12 28,020	5,360				
Pará Shipments to Europe	15,480	5,650	21,130	17,260	16,880	19,240
Pará Shipments to America	14,650	2,450	17,100	17,500	11,640	16,270
England Landings, net			14,962	12,523	12,833	14,520
England Deliveries, net			14,449	15,873	10,613	14,071
America Landings, net			16,720	19,745	12,090	16,330
America Deliveries, net			16,660	19,465	11,590	17,030
Continental Imports, net			4,360	2,870	2,670	2,540
Continental Deliveries, net			4,105	2,940	2,650	2,540

POSITION—1ST MAY, 1913.

Increase in Receipts during April, 1913, against April, 1912	270
Increase in Receipts—Crop, July/April, 1912/13, against 1911/12	3,590
Decrease in Deliveries—Crop, July/April, 1912/13, England and Continent, against 1911/12	259
Decrease in Deliveries—Crop, July/April, 1912/13, America, against 1911/12	2,805
Decrease in Visible Supply Pará Grades, against 1st May last year	257
Increase in Stock, England, April 30th, 1913, against April 30th, 1912	163

WM. WRIGHT & CO., Brokers.

Liverpool, 2nd May, 1913.

During the month 40 tons Pará have been shipped from Europe to America.

Liverpool:

WILLIAM WRIGHT & Co. report [May 1, 1913].

Fine Pará.—There has been more speculative demand; prices declined from 3*s.* 8*d.* [89 cents] to 3*s.* 3*d.* [79 cents], then reacted somewhat, finally closing at 3*s.* 5¼*d.* [84 cents] for near position and 3*s.* 5¾*d.* [85 cents] for distant. The undertone is steady in spite of the absence of American demand and large first-hand stocks in Brazil; considering the demand for this grade, supplies are not too ample, the bulk of the crop increase being in caucho. Receipts this month are 3,540 tons, including 1,430 tons caucho, against 4,265 tons last month and 3,270 tons last year, bringing the crop up to date to 36,975 tons against 33,380 tons last year, showing an increase of 1,190 tons rubber and 2,405 tons caucho.

Rotterdam

HAVELAAR & DE VRIES report [May 13]:

At the sale of May 9 about 40 tons were offered, including 20 tons *Hevea* and 14 tons *Ficus*. The former went at 2 per cent. and the latter at 5 per cent. below valuations. Inquiry being good, nearly the whole quantity was sold.

Amsterdam

JOOSTEN & JANSEN report [April 30]:

The quantities declared for the sale of May 16 include about 93 tons, the bulk of which is *Hevea*. There are also included about 11 tons *Ficus*, of which 5 tons are plantation and 6 tons wild.

Rubber Scrap Prices.

LATE NEW YORK QUOTATIONS.—Prices paid by consumers for carload lots, per pound—are practically unchanged.

	May 26, 1913.
Old rubber boots and shoes—domestic	9⅜@ 9½
Old rubber boots and shoes—foreign	9¼@ 9⅜
Pneumatic bicycle tires	5¾@ 5⅞
Automobile tires	9⅝
Solid rubber wagon and carriage tires	9 @ 9¼
White trimmed rubber	10¾@11
Heavy black rubber	4¾@ 5
Air brake hose	5¾
Garden hose	1⅛@ 1½
Fire and large hose	2 @ 2⅛
Matting	⅝@ ¾
No. 1 white auto tires	11¾@11⅞

WEEKLY MOVEMENT OF LONDON PRICES FOR FINE PARA, 1912 AND 1913.

[IN SHILLINGS AND PENCE PER POUND.]

July 5, 1912	4/9	December 20	4/6½
July 12	4/10	December 27	4/7½
July 19	4/10	January 3, 1913	4/7¼
July 26	4/11¾	January 10	4/6½
August 2	4/11	January 17	4/6½
August 9	5/0½	January 24	4/5¼
August 16	5/0½	January 31	4/4
August 23	5/2	February 7	4/2¾
August 30	5/1¾	February 14	4/3
September 6	4/11½	February 21	4/0½
September 13	4/9½	February 28	4/0½
September 20	4/8	March 7	3/10¾
September 27	4/7	March 14	3/11¼
October 4	4/7	March 20	3/11
October 11	4/7	March 28	3/9½
October 18	4/6½	April 4	3/6¼
October 25	4/6	April 11	3/4½
November 1	4/4½	April 18	3/4¾
November 8	4/5	April 25	3/4½
November 15	4/5¼	May 2	3/5½
November 22	4/5¼	May 9	3/8¾
November 29	4/5½	May 16	3/10
December 6	4/7	May 23	3/9
December 13	4/7		

IMPORTS FROM PARA AT NEW YORK.

[The Figures Indicate Weight in Pounds.]

APRIL 24.—By the steamer *Clement*, from Pará and Manáos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Arnold & Zeiss	105,700	.....	98,300	66,300=	270,300
General Rubber Co.	41,000	4,000	6,400	.....=	51,400
Meyer & Brown	55,000	8,900	75,100	107,800=	246,800
Meyer & Brown	.....	5,900	9,900	.....=	15,800
Astlett & Co.	21,100	5,000	.....	19,000=	45,100
Ed. Maurer	34,300	600	17,200	.....=	52,100
Henderson & Korn	.....	.....	48,900	.....=	48,900
Henderson & Korn	1,100	.....	9,900	.....=	11,000
Ed. Maurer	2,900	400	200	.....=	3,500
De Lagotellerie	12,500	1,400	5,300	.....=	19,200
	273,600	26,200	271,200	193,100=	764,100
MANAOS.					
Arnold & Zeiss	126,700	700	30,100	10,200=	167,700
General Rubber Co.	12,900	3,500	8,700	800=	25,900
Meyer & Brown	.....	.....	5,500	.....=	5,500
Ed. Maurer	.....	3,000	.....	.....=	3,000
Robinson & Co.	16,000	10,400	10,400	.....=	36,800
American Export Co.	22,200	.....	.....	.....=	22,200
	177,800	17,600	54,700	11,000=	261,100
Total	451,400	43,800	325,900	204,100=	1,025,200
IQUITOS.					
G. Amsinck & Co.	.....	.....	5,300	.....=	5,300
Astlett & Co.	.....	.....	4,800	.....=	4,800
Total	.....	.....	10,100	.....=	10,100

MAY 5.—By the steamer *Vincent*, from Pará and Manáos:

Arnold & Zeiss	21,900	.....	57,900	116,300=	196,100
Meyer & Brown	24,800	3,700	11,700	85,600=	125,800
General Rubber Co.	49,900	5,800	21,200	4,400=	81,300
Hagemeyer & Brunn	1,800	.....	16,500	.....=	18,300
De Lagotellerie	7,100	1,100	3,300	.....=	11,500
G. Amsinck & Co.	1,400	400	2,000	3,900=	7,700
Henderson & Korn	40,200	5,300	31,000	85,300=	161,800
Ed. Maurer	8,300	1,200	63,900	35,000=	108,400
Astlett & Co.	1,100	1,400	.....	3,900=	6,400
	156,500	18,900	207,500	334,400=	717,300

MANAOS.					
Arnold & Zeiss	91,200	.....	64,200	18,400=	173,800
Meyer & Brown	21,400	3,600	50,300	136,500=	211,800
General Rubber Co.	.....	.....	21,000	.....=	21,000
Henderson & Korn	34,500	10,100	19,800	21,000=	85,400
Robinson & Co.	17,500	.....	7,900	.....=	25,400
American Export Co.	44,000	.....	.....	.....=	44,000
	208,600	13,700	163,200	175,900=	561,400
Total	365,100	32,600	370,700	510,300=	1,278,700

MAY 17.—By the steamer *Gregory*, from Pará and Manáos:

Arnold & Zeiss	36,600	2,500	37,500	35,300=	111,900
General Rubber Co.	22,400	2,800	24,700	2,200=	52,100
Meyer & Brown	.....	.....	24,900	.....=	24,900
Meyer & Brown	.....	.....	30,400	.....=	30,400
Henderson & Korn	2,100	19,400	47,100	4,400=	73,000
Ed. Maurer	52,500	700	5,500	500=	59,200
Astlett & Co.	8,200	1,400	.....	16,200=	25,800
De Lagotellerie	4,300	700	7,900	.....=	12,900
Hagemeyer & Brunn	2,500	1,100	6,600	.....=	10,200
	128,600	28,600	184,600	58,600=	400,400
MANAOS.					
Arnold & Zeiss	60,300	3,000	13,000	20,500=	96,800
Meyer & Brown	35,600	18,600	24,500	12,400=	91,100
General Rubber Co.	15,800	.....	.....	.....=	15,800
Ed. Maurer	16,300	3,800	11,500	12,900=	44,500
Henderson & Korn	8,700	4,000	9,800	11,300=	33,800
Robinson & Co.	23,600	700	3,300	1,200=	28,800
American Export Co.	3,400	.....	.....	.....=	3,400
Crossman & Sielcken	3,400	300	3,700	.....=	7,400
	167,100	30,400	65,800	58,300=	321,600
Total	295,700	59,000	250,400	116,900=	722,000
ITACOATIARA.					
Harne Andre	2,200	.....	2,400	3,600=	8,200

PARA RUBBER VIA EUROPE.

APRIL 26.—By the *Celtic*=Liverpool:

	Pounds.
James T. Johnstone (Fine)	9,000

APRIL 28.—By the *Carmania*=Liverpool:

Arnold & Zeiss (Caucho Ball)	11,200

MAY 5.—By the *Caronia*=Liverpool:

N. Y. Commercial Co. (Fine)	27,000	
Raw Products Co. (Fine)	3,000	
Various (Fine)	11,000	41,000

MAY 9.—By the *Patricia*=Hamburg:

Wallace L. Gough (Fine)	6,700

MAY 12.—By the *Campania*=Liverpool:

Arnold & Zeiss (Fine)	33,500

MAY 12.—By the *Amerika*=Hamburg:

Ed Maurer (Fine)	48,500

MAY 16.—By the *Mauretania*=Liverpool:

Robinson & Co. (Fine)	11,200

OTHER NEW YORK ARRIVALS.

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

APRIL 23.—By the *Trent*=Colon:

	Pounds.	
G. Amsinck & Co.	4,500	
A. M. Capen's Sons	4,000	
R. del Castillo	3,000	
Mecke & Co.	1,200	
Andean Trading Co.	500	
A. Held	500	13,700

APRIL 23.—By the *Prinz August Wilhelm*=Colombia:

Gillespie Bros.	600

APRIL 25.—By the *Allianca*=Colon:

Gillespie Bros.	1,500

APRIL 25.—By the *Proteus*=New Orleans:

Various	8,500

APRIL 25.—By the *El Oriente*=Galveston:

Various	*10,500

APRIL 26.—By the *Esperanza*=Mexico:

E. Steiger & Co.	3,500	
W. L. Wadleigh & Co.	1,000	
Dufourca & Co.	1,000	5,000

APRIL 26.—By the *Celtic*=Liverpool:

Adolph Hirsch & Co.	11,200

APRIL 28.—By the *Rochambeau*=Havre:

Michelin Tire Co.	30,000

APRIL 28.—By the *Zacapa*=Colombia:

R. Del Castillo	3,500

APRIL 28.—By the *Vigilancia*=Mexico:

G. Amsinck & Co.	1,000	
H. Marquardt & Co.	500	
R. G. Barthold	500	2,000

APRIL 28.—By the *Suriname*=Colon:

G. Amsinck & Co.	2,500	
Rosenthal & Sons	1,500	
Manhattan Rubber Mfg. Co.	1,200	5,200

APRIL 29.—By the *Prinz Sigismund*=Colombia:

Mecke & Co.	7,500	
Caballero & Blanco	300	
De Lima Cortissoz	300	8,100

APRIL 30.—By the *Emil L. Boas*=Colon:

Rosenthal & Sons	1,500

MAY 1.—By the *Creole*=New Orleans:

Various	1,000

MAY 1.—By the *Almirante*=Colombia:

Schulz Ruckgaber	3,500	
R. del Castillo	1,000	4,500

MAY 2.—By the *Guantanamo*=Tampico:

Continental-Mex. Rubber Co.	*206,000	
Mexican Crude Rubber Co.	*45,000	
Ed. Maurer	*33,500	*284,500

MAY 2.—By the *Mexico*=Mexican Ports:

J. W. Wilson & Co.	2,500	
General Export and Commission Co.	300	
E. Steiger & Co.	1,000	
W. L. Wadleigh	3,000	
Mecke & Co.	500	7,300

MAY 2.—By the *Swedish Prince*=Bahia:

Adolph Hirsch & Co.	3,500

MAY 6.—By the *Santiago*=Tuxpan:

H. Marquardt & Co.	500

MAY 6.—By the *Santiago*=Tampico:

Continental-Mex. Rubber Co.	*56,000	
Various	*7,500	*63,500

MAY 7.—By the *Cevic*=Liverpool:

Adolph Hirsch & Co.	30,000

MAY 7.—By the *Prince Joachim*=Colombia:

Wessels, Kulenkampff & Co.	1,000	
Suzarte & Whitney	600	1,600

MAY 8.—By the *Magdalena*=Colombia:

Kunhardt & Co.	3,000	
R. del Castillo & Co.	1,500	4,500

MAY 8.—By the *Momus*=New Orleans:

Various	3,700

MAY 8.—By the *Santa Marta*=Colombia:

R. del Castillo & Co.	1,000

MAY 9.—By the *Advance*=Colon:

G. Amsinck & Co.	12,000	
R. G. Barthold & Co.	500	
Broedermann & Litzrodt	600	13,100

MAY 10.—By the *Monterey*=Mexico:

Maitland, Coppell & Co.	6,000	
Willard Hawes & Co.	3,000	9,000

MAY 12.—By the *Prinz Eitel Frederick*=Colombia:

Kunhardt & Co.	3,500	
Caballero & Blanco	700	4,200

MAY 12.—By the *Proteus*=New Orleans:

Various	1,500

MAY 12.—By the *Frutera*=Colon:

Rosenthal & Sons	1,000	
Eggers & Heinlein	800	
General Export Commission Co.	300	2,100

MAY 12.—By the *Baltic*=Liverpool:

Adolph Hirsch & Co.	6,000

MAY 12.—By the *Voltaire*=Bahia:

Adolph Hirsch & Co.	6,000

MAY 12.—By the *Camaguey*=Tampico:

Continental-Mex. Rubber Co.	*350,000	
Mexican Crude Rubber Co.	*45,000	
Ed. Maurer	*40,000	
Chas. T. Wilson	*10,000	
Various	*30,000	*475,000

MAY 13.—By the *Panama*=Colon:

Pottberg, Ebeling & Co.	1,100

MAY 13.—By the *Minneapolis*=London:

Various	67,000

MAY 14.—By the *Carl Schurz*=Colombia:

Pottberg, Ebeling & Co.	1,700	
Gravenhorst & Co.	800	2,500

MAY 16.—By the *Dakotan*=Mexico:

G. Amsinck & Co.	3,000

MAY 16.—By the *Morro Castle*=Mexico:

Lawrence Johnson	3,000	
Murphy & Fultz	2,500	
W. L. Wadleigh	1,200	
American Trading Co.	1,200	
J. W. Wilson & Co.	500	
Harburger & Stack	300	
Mecke & Co.	200	8,900

MAY 17.—By the *Asiatic Prince*=Bahia

Adolph Hirsch & Co.	2,000

MAY 19.—By the *Albingia*=Colombia:

G. Amsinck & Co.	1,000	
Caballero & Blanco	1,000	2,000

MAY 19.—By the *Creole*=New Orleans:

Various	1,500

MAY 19.—By the *El Sol*=Galveston:

Various	*11,200

MAY 21.—By the *Prinz August Wilhelm*=Colombia:

Wessels, Kulenkampff	800	
Eggers & Heinlein	500	
M. C. Keith	1,000	2,300

MAY 21.—By the *Tagus*=Colon:

G. Amsinck & Co.	1,500	
Mecke & Co.	2,200	
A. M. Capen's Sons	2,000	
Camacho Roldau & Van Sickle.	2,000	
Heilbron Wulff & Co.	1,200	
American Trading Co.	1,000	
R. del Castillo & Co.	700	10,600

AFRICAN

APRIL 23.—By the *Finland*=Antwerp:

	Pounds.	
James T. Johnstone	15,500	
L. Blitz	4,500	20,000

APRIL 26.—By the *Celtic*=Liverpool:

James T. Johnstone	15,700

APRIL 28.—By the *Carmania*=Liverpool:

Various	11,000

APRIL 28.—By the *St. Paul*=Southampton:

Robinson & Co.	11,200

APRIL 28.—By the *Rochambeau*=Havre:

Michelin Tire Co.	33,500	
Meyer & Brown	4,500	38,000

APRIL 28.—By the *Kaiserin Auguste Victoria*=Hamburg:

Ed Maurer	33,500	
Wallace L. Gough	12,500	
Rubber Trading Co.	4,500	50,500

MAY 1.—By the *New Amsterdam*=Amsterdam:

Various	13,500

MAY 5.—By the *Philadelphia*=Southampton:

Robinson & Co.	20,500

MAY 6.—By the *Kroonland*=Antwerp:

Various	36,000

MAY 9.—By the *Patricia*=Hamburg:

Meyer & Brown	18,000	
Ed. Maurer	43,000	
Arnold & Zeiss	22,500	
General Rubber Co.	22,500	
Wallace L. Gough	26,000	
Henderson & Korn	45,000	177,000

MAY 9.—By the *Salamanca*=Hamburg:

Wallace L. Gough	37,500

MAY 12.—By the *Campania*=Liverpool:

Arnold & Zeiss	5,000	
Various	22,500	27,500

MAY 12.—By the *Baltic*=Liverpool:

James T. Johnstone	1,000	
Various	9,000	10,000

MAY 12.—By the *Amerika*=Hamburg:

Ed. Maurer	4,500	
Henderson & Korn	11,500	16,000

MAY 13.—By the *Zeeland*=Antwerp:

Various		14,000

MAY 17.—By the *La Provence*=Havre:

Meyer & Brown		7,500

MAY 17.—By the *Adriatic*=Liverpool:

James T. Johnstone		11,200

MAY 17.—By the *New York*=Southampton:

Arnold & Zeiss	22,500	
Various	2,500	25,000

MAY 19.—By the *Californie*=Havre:

Arnold & Zeiss		6,500

EAST INDIAN.

[*Denotes Plantation Rubber.]

		POUNDS.
APRIL 23.—By the *Finland*=Antwerp:		
Meyer & Brown		*44,000
APRIL 24.—By the *Oceanic*=Southampton:		
Arnold & Zeiss	*33,500	
Charles T. Wilson	*33,500	
Ed. Maurer	*29,000	
Rubber Trading Co.	*15,500	
Raw Products Co.	*6,500	
Robinson & Co.	*700	*118,700
APRIL 26.—By the *Neidenfels*=Colombo:		
General Rubber Co.	*11,200	
Ed. Maurer	*5,500	*16,700
APRIL 26.—By the *Indramayo*=Singapore:		
Ed. Maurer	*45,000	
L. Littlejohn & Co.	*22,500	
Malaysian Rubber Co.	*11,200	
E. Bonstead & Co.	*11,200	
James T. Johnstone	*3,500	
Various	*11,200	*104,600
APRIL 26.—By the *Potsdam*=Amsterdam:		
Various		*2,000
APRIL 28.—By the *St. Paul*=Southampton:		
Meyer & Brown	*11,000	
Ed. Maurer	*87,500	
Robinson & Co.	1,500	
Arnold & Zeiss	*2,500	
William H. Stiles	*1,100	*103,600
APRIL 28.—By the *Rochambeau*=Havre:		
Michelin Tire Co.		*33,500
APRIL 28.—By the *Kansas*=Colombo:		
Meyer & Brown	*90,000	
Ed. Maurer	*33,500	
N. Y. Commercial Co.	*8,500	
H. W. Peabody & Co.	*3,500	
Various	*2,500	*138,000
APRIL 28.—By the *Lapland*=Antwerp:		
Meyer & Brown		*30,000
APRIL 28.—By the *Indradeo*=Singapore:		
Ed. Maurer	*103,000	
Malaysian Rubber Co.	*12,500	
General Rubber Co.	*7,000	
L. Littlejohn & Co.	*29,000	
Various	*5,000	*156,500
APRIL 28.—By the *Kaiserin Auguste Victoria*=Hamburg:		
Various		*19,000
APRIL 28.—By the *Minnewaska*=London:		
Meyer & Brown	*34,500	
James T. Johnstone	*22,500	
Charles T. Wilson	*13,500	
L. Littlejohn & Co.	*11,200	
Various	*31,000	*112,700
APRIL 30.—By the *Olympic*=Southampton:		
Meyer & Brown	*70,000	
N. Y. Commercial Co.	*100,800	
Ed. Maurer	*8,000	
Arnold & Zeiss	*13,500	
A. W. Brunn	*2,200	
Raw Products Co.	*2,500	
Various	*13,500	*210,500
MAY 1.—By the *New Amsterdam*=Amsterdam:		
Rubber Trading Co.		*5,000
MAY 3.—By the *Karema*=Colombo:		
Meyer & Brown	*42,000	
N. Y. Commercial Co.	*13,500	
H. W. Peabody & Co.	*22,500	
Ed. Maurer	*4,500	*82,500
MAY 5.—By the *Philadelphia*=Southampton:		
Meyer & Brown	*45,000	
N. Y. Commercial Co.	*140,000	
Ed. Maurer	*45,000	
Robinson & Co.	*27,500	
Charles T. Wilson	*2,500	
A. W. Brunn	*4,500	
Arnold & Zeiss	36,500	
Raw Products Co.	*2,200	
Rubber Trading Co.	*1,500	
L. Littlejohn & Co.	*15,000	
Various	*140,000	*459,700
MAY 6.—By the *Mesaba*=London:		
Meyer & Brown	*54,500	
James T. Johnstone	*14,000	
Charles T. Wilson	*33,500	
General Rubber Co.	*56,000	
Ed. Maurer	*15,500	
Various	*10,000	*183,500
MAY 6.—By the *Kroonland*=Antwerp:		
Meyer & Brown	*43,000	
Arnold & Zeiss	*45,000	*88,000
MAY 6.—By the *Gramsbergen*=Amsterdam:		
Manhattan Rubber Mfg. Co.		*7,000
MAY 6.—By the *Ambria*=Singapore:		
Meyer & Brown	*11,000	
Ed. Maurer	*62,500	
James T. Johnstone	*8,000	
General Rubber Co.	*7,500	
Various	*36,000	*125,000
MAY 7.—By the *Cevic*=Liverpool:		
L. Littlejohn & Co.		*33,500
MAY 8.—By the *Majestic*=Southampton:		
Meyer & Brown	*34,000	
Ed. Maurer	*15,000	
Robinson & Co.	*2,500	
Rubber Trading Co.	*13,000	
Arnold & Zeiss	*10,000	
Ed. Maurer	*15,500	
Various	*8,000	*98,000
MAY 9.—By the *Patricia*=Hamburg:		
Charles T. Wilson	*6,000	
Wallace L. Gough	*8,000	
Ed. Maurer	*16,500	*30,500
MAY 12.—By the *Amerika*=Hamburg:		
Henderson & Korn		*2,500
MAY 13.—By the *Zeeland*=Antwerp:		
Arnold & Zeiss	*117,000	
Meyer & Brown	*8,000	*125,000
MAY 13.—By the *Minneapolis*=London:		
Meyer & Brown	*48,000	
General Rubber Co.	*33,500	
James T. Johnstone	*13,500	
Charles T. Wilson	*50,000	
Robert Badenhop	8,500	
Various	*11,000	*164,500
MAY 15.—By the *Oceanic*=Southampton:		
Meyer & Brown	*57,000	
Ed. Maurer	*104,000	
Arnold & Zeiss	*60,000	
Charles T. Wilson	*40,000	
Rubber Trading Co.	*24,000	
Raw Products Co.	*15,000	
Robinson & Co.	*5,000	
William H. Stiles	*10,000	*315,000
MAY 17.—By the *New York*=Southampton:		
Meyer & Brown	*33,000	
N. Y. Commercial Co.	*33,500	
Robinson & Co.	*33,500	
Arnold & Zeiss	*25,500	
Rubber Trading Co.	*9,000	
Various	*11,200	*145,700
MAY 19.—By the *Kioto*=Singapore:		
Ed. Maurer	*55,000	
Arnold & Zeiss	*45,000	
L. Littlejohn & Co.	*30,000	
Malaysian Rubber Co.	*15,000	
James T. Johnstone	*5,500	
Broome Rubber Co.	*3,500	
Bonstead & Co.	*12,500	
Various	*50,000	*216,500
MAY 20.—By the *Minnehaha*=London:		
Meyer & Brown	*28,500	
James T. Johnstone	*45,000	
General Rubber Co.	*145,000	
Adolph Hirsch & Co.	*33,500	
L. Littlejohn & Co.	*33,500	
Various	8,500	*294,000
MAY 20.—By the *Finland*=Antwerp:		
Meyer & Brown		*38,000
MAY 21.—By the *Olympic*=Southampton:		
Meyer & Brown	*42,000	
Arnold & Zeiss	*40,000	
Charles T. Wilson	*67,200	
A. W. Brunn	*3,500	
William H. Stiles	*3,000	
Various	*7,500	*163,200
MAY 22.—By the *Bulgarian Prince*=Colombo:		
Meyer & Brown	*106,800	
General Rubber Co.	*11,200	
H. W. Peabody & Co.	*8,000	
Ed. Maurer	*61,000	*187,000

BOSTON ARRIVALS.

IMPORTS IN APRIL, 1913.

	Pounds.	Value.
Gutta-jelutong (Pontianak)	1,696,086	$82,662
Guta-percha	7,187	1,276
India-rubber	207,215	155,158

CUSTOM HOUSE STATISTICS.

PORT OF NEW YORK—APRIL, 1913.

Imports:	Pounds.	Value.
India-rubber	8,500,595	$6,252,156
Balata	46,889	26,362
Guayule	799,917	346,909
Gutta-percha	179,638	41,818
Gutta-jelutong (Pontianak)	1,454,417	72,073
Total	10,981,456	$6,739,318
Exports:		
India-rubber	63,931	44,834
Balata	.....	.....
Guayule	.....	.....
Gutta-percha	.....	.....
Reclaimed rubber	107,319	14,731
Gutta-jelutong (Pontianak)	.....	.....
Rubber scrap, imported	4,012,580	350,027
Rubber scrap, exported	422,046	58,204

EXPORTS OF INDIA-RUBBER FROM MANAOS FOR APRIL, 1913 (IN KILOGRAMS).

	NEW YORK.					EUROPE.					GRAND
EXPORTERS.	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	Fine.	Medium.	Coarse.	Caucho.	TOTAL.	TOTAL.
Zarges, Ohliger & Ca.	132,465	1,773	53,657	24,554	212,449	136,336	26,181	24,984	201,526	389,027	601,476
General Rubber Co. of Brazil	40,840	12,274	55,019	74,359	182,992	74,834	25,993	15,630	126,581	243,038	426,030
Ahlers & Ca.	58,251	11,972	25,581	16,703	112,507	103,907	11,921	31,079	74,852	221,759	334,266
De Lagotellerie & Co.	22,560	.....	.....	.....	22,560	40,796	20,200	22,132	11,891	95,019	117,579
J. G. Araujo	1,600	160	1,850	.....	3,610	2,301	786	3,370	1,626	8,583	12,193
Mesquita & Co.	.....	.....	.....	.....	.....	448	.....	1,374	537	2,359	2,359
Semper & Co.	.....	.....	.....	.....	.....	2,658	.....	841	4,751	8,250	8,250
Théodore Lévy, Camille & Co.	.....	.....	.....	.....	.....	.....	437	806	25,181	26,424	26,424
W. Peters & Co.	7,756	3,241	5,774	6,452	23,223	1,120	160	2,730	450	4,460	27,683
Sundries	.....	.....	.....	.....	.....	11,694	1,424	4,467	9,853	27,438	27,438
	263,472	29,420	141,831	122,568	557,341	374,094	87,102	107,913	457,248	1,026,357	1,583,698
De Iquitos, direct	4,438	174	405	.....	5,017	47,222	245	14,658	156,350	218,475	223,492
Total, April, 1913	267,910	29,594	142,236	122,568	562,358	421,316	87,347	122,571	613,598	1,244,832	1,807,190
Total, March, 1913	228,317	32,464	74,938	34,356	370,075	448,565	87,307	179,687	588,560	1,304,119	1,674,194
Total, February, 1913	482,593	98,982	173,593	202,059	957,227	608,121	146,075	137,106	444,567	1,335,869	2,293,096
Total, January, 1913	472,818	77,126	217,249	166,875	934,068	658,309	126,008	137,093	481,836	1,403,246	2,337,314

INDIA RUBBER WORLD

Vol. 48. JUNE 1, 1913. No. 3.

TABLE OF CONTENTS.

Editorial:

Foreign Factories in the United States 449
Reducing Rubber Prices to Encourage New Uses 449
Advantages of Combining Tires with Footwear 450
Rubber in College Theses 450
The Best Rubber School 451
The Call of Cheap Labor 451
Minor Editorials 451

Rubber in Southern Brazil ..... *By the Editor* 453
[With 11 Illustrations.]

Interesting Rubber Souvenirs 458
[With 2 Illustrations.]

French View of Brazilian Situation 458

The Plantation Rubber Industry ..... *By Cyril E. S. Baxendale* 459
[With Portrait.]

The Washing of Crude Rubber 463
[With 9 Illustrations.]

Possible Rubber Producers in the Temperate Zone ..... *By Charles P. Fox* 467
[With Portrait.]

The Purchasing Agent ..... *By Frederic Dannerth* 469

India Rubber Goods in Commerce 470

The Akers Rubber Commission in the Amazon Valley 471

Encouragement of New Uses for Rubber 473

Obituary Record 474
[With portrait of Mr. E. B. Kelley.]

The Increasing Popularity of Rubber-Soled Summer Shoes 475
[With 6 Illustrations.]

Rubber Goods Mfg. Co.'s Fourteenth Annual Report 476

The United States Rubber Co.'s Annual Report 477

The Rubber Trade in Boston ..... *Our Correspondent* 479

The Rubber Trade in Akron ..... *Our Correspondent* 481

The Rubber Trade in Cincinnati ..... *Our Correspondent* 481

The Rubber Trade in Chicago ..... *Our Correspondent* 482

The Rubber Trade in Rhode Island ..... *Our Correspondent* 482

The Rubber Trade in San Francisco ..... *Our Correspondent* 483

The Rubber Trade in Trenton ..... *Our Correspondent* 484

New Rubber Goods in the Market 485

News of the American Rubber Trade 486

India-Rubber Trade in Great Britain ..... *By Our Regular Correspondent* 492

Some Rubber Interests in Europe 493

Notes from British Guiana ..... *By Our Regular Correspondent* 494

Some Rubber Planting Notes 495

Some Rubber Notes from Para ..... *By a Special Correspondent* 495

Recent Patents Relating to Rubber 496
[United States, Great Britain.]

Report of the Crude Rubber Market 498

Antwerp:

RUBBER STATISTICS FOR APRIL.

DETAILS.	1913.	1912.	1911.	1910.	1909.
Stocks, March 1...*kilos*	651,505	359,016	645,614	499,102	595,855
Arrivals in April—					
Congo sorts	385,070	360,605	131,553	340,456	219,645
Other sorts	8,138	15,117	44,791	40,014	91,908
Plantation sorts	246,814	129,715	90,038	49,400	18,724
Aggregating	1,291,527	864,453	911,991	928,972	926,132
Sales in April.....	301,257	426,940	312,877	458,504	318,345
Stocks, April 30.....	990,270	437,513	599,114	470,468	607,787
Arrivals since Jan. 1—					
Congo sorts	1,076,786	1,091,077	1,072,515	1,171,286	1,001,032
Other sorts	43,316	45,735	205,968	120,169	368,972
Plantation sorts	683,711	407,325	257,562	178,094	88,365
Aggregating	1,803,813	1,544,137	1,536,045	1,469,549	1,458,369
Sales since January 1..	1,324,603	1,781,162	1,525,143	1,540,593	1,446,317

RUBBER ARRIVALS FROM THE CONGO.

APRIL 23.—By the steamer *Anversville:*

Bunge & Co	(Société Générale Africaine) *kilos*	26,800	
do	(Comptoir Commercial Congolais)	15,700	
do	(Belgika)	1,800	
do	(Comfina)	1,000	
do	(Chemins de fer Grande Lacs)	8,000	
do	(Forminière)	200	
do		1,200	
Crédit Colonial and Commercial.			
do	(Velde)	9,300	
L. & W. Van de Velde	(Cie du Kasai)	79,600	
do	(Comfina)	12,500	
do	(Uelé)	3,400	
Charles Dethier	(Comminière)	3,100	
do	(American Congo Co.)	3,300	
Divers		7,000	172,900

Plantation Rubber From the Far East

EXPORTS OF CEYLON-GROWN RUBBER.

(From January 1 to April 21, 1913. Compiled by the Ceylon Chamber of Commerce.)

	1912.	1913.
To Great Britain .....*pounds*	1,950,654	3,501,382
To United States	1,234,188	2,270,021
To Belgium	451,218	822,696
To Germany	39,905	64,862
To Australia	34,002	176,617
To Japan	5,687	75,502
To Austria	5,320	25,515
To Italy	4,692	22,460
To Holland	.....	992
To Canada	12,121	.....
To Norway and Sweden	39	.....
Total	3,737,826	6,960,047

[Same period 1911—1,509,408; same 1910—740,937.]

The export figures of rubber for 1913 given in the above table include the imports re-exported. (These amount to 647,683 lb.—507,452 lb. from the Straits and 140,231 lb. from India.—Ed. C. O.) To arrive at the approximate quantity of Ceylon rubber exported for 1913 to date, deduct the quantity of imports from the total exports. In previous years the exports of Ceylon rubber only were given.

TOTAL EXPORTS FROM MALAYA.

(From January 1 to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	Singapore. April 10.	Penang. Feb. 28.	Port Swettenham. March 31.	Total.
Great Britain...*pounds*	4,876,609	2,035,333	6,409,269	13,321,211
Continent	64,912	10,533	801,859	877,304
Japan	167,612	.....	.....	167,612
Ceylon	.....	15,467	393,460	408,927
United States	1,849,445	49,333	.....	1,898,778
Australia	26,540	.....	.....	26,540
Total, 1913	6,985,118	2,110,666	7,604,588	16,700,372
Same period, 1912.....	3,727,218	847,722	3,945,893	8,520,833
Same period, 1911.....	1,676,849	330,267	3,458,123	5,465,239
Same period, 1910.....	944,557	496,971	1,906,728	3,348,256